LEGISLATIVE COUNCIL OF FIJI COUNCIL PAPER NO. 11 OF 1966

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COLONY OF FIJI

FIJI DEVELOPMENT PLAN 1966-1970

DEVELOPMENT PLANNING REVIEW

CENTRAL PLANNING OFFICE
1966

Price 7s. 6d. Government Press, Suva, Fiji 15 CP 66—800

21 DEC. 1966
01948

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INTRODUCTION

A decision was taken by Government in 1964 to adopt economic planning as the common basis for its development policies. " Planning " as a technical term has over the years acquired a reasonably precise meaning; it signifies the joint evaluation and the co-ordination of all efforts directed towards the economic and social progress of the country. The usefulness of systematic methods of planning is widely recognised. The British Government now specifically requires the preparation of a comprehensive Development Plan in support of requests for further aid under the Colonial Development and Welfare Act.

It was decided to prepare a Development Plan 1966–1970. The timing of the Plan was dictated by the fact that the new Colonial Development and Welfare Act comes into operation in April, 1966. Fiji is, of course, dependent for a large part of its development expenditure on aid under this legislation.

During the last two years Government Departments have been engaged on formulating their objectives and drawing up sectoral plans for incorporation in the general plan. The Central Planning Office has operated as the technical Secretariat in co-ordinating these activities. In order to dispel misconceptions it may be stated that the Central Planning Office has not been concerned with substantive policy proposals, although it has helped in identifying subjects requiring survey and study and in formulating requests for technical assistance from outside sources such as the British Government or the United Nations.

The content of the Plan 1966–1970 will not make major changes from previously existing development policies. However, the Plan has an enlarged scope and integrates resources and expenditure into the general economic framework of Fiji. It is in this aspect of presenting a consolidated economic balance sheet that the main purpose of systematic planning lies. The Plan is also articulate and expository and thus permits a large degree of understanding and assessment by those not familiar with the details of the various matters.

This document, for which the Central Planning Office is responsible, bears the title " Development Planning Review ". It presents policy problems and proposals, and it also makes projections of resources and prior commitments thereby defining the limits within which the Plan must be kept.

Another document will contain Government's allocations in money terms to the various purposes. The allocations in their entirety must fit into the total of resources projected as being available for Government recurrent and capital expenditure.

The Development Plan 1966–1970 embodies a set of planning methods, and one may hope that the procedures thus established will be further evolved to serve Government as an instrument in the appraisal and formulation of development policies in the future.

ERNEST KNOBLOCK,
Central Planning Office.

Suva, February, 1966.

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DEVELOPMENT PLANNING REVIEW

PART I—DEVELOPMENT PROBLEMS AND POTENTIAL

1. The first part of this Review aims at giving the salient facts of Fiji's economic present, and it outlines the limitations and opportunities for future development.

2. A statistical estimate is offered of Fiji's National Income showing the size and structure of the economy. This is intended to serve as a " benchmark " for planning.

3. There follow discussions of problems and long-term development perspectives, leading to the conclusion that the Development Plan 1966–1970 should be conceived in two parts. One part will be concerned with the actual provisions for expenditure 1966–1970. The other part will cover the surveys and studies, the results of which will be needed for further action beyond 1970; it deals therefore with the foundations for future Development Plans. The distinction between the two parts should help in bringing out the important point that positive policies at any moment of time must be based on previous fact-finding and project making, treated as a separate and preliminary exercise.

State of the Economy

4. Economic policy and planning must be grounded on a comprehensive understanding of the structure of the economy. It is of the essence of planning to assess the forces at work in the economy and to understand their inter-dependence. In particular, it is necessary to take stock of the total resources available in the country and make sure that the various demands made on them are not excessive. It is desirable to establish priorities and to ensure a fair balance between the different purposes within the limits set by economic feasibility and by the more remote repercussions of specific action.

5. Techniques have been developed for estimating the total supply and the total demand of goods and services which permit a balance sheet to be drawn up and show the inter-relation between the sectors of the economy. They are termed " national accounting " and are based on statistics or reasoned estimates of all the relevant magnitudes in the economy. Corresponding to the accounting concepts of a balance sheet, two types of sectors are distinguished: the Supply Sectors and the Demand Sectors. The Supply or Production Sectors describe the origin of the goods and services at the disposal of the economy, while the Demand Sectors show the eventual use of all goods and services.

6. Up to the present time, there has been in Fiji no regular national income accounting, or national income statistics. Carleen O'Loughlin made a National Income Study for the years 1950–53, the results of which were published in Council Paper No. 44 of 1956, " The Pattern of the Fiji Economy." For the purposes of the Economic Development Plan 1966–1970, the Central Planning Office has made National Income estimates for Fiji today. They have not had the benefit of a comprehensive system of statistics; and it is the intention of Government to set up a suitable system of statistical returns which will provide National Income data on a regular basis.

7. The purpose of the National Income estimates presented here is to serve as a planning tool in quantifying the main magnitudes of the economy. The estimates are sufficiently reliable to be used in this context. However, in future it will be necessary to have more precise data in order to measure precisely the changes in National Income and Expenditure from year to year and to check the progress that is being made towards planning objectives.

8. The Fiji National Income Estimates for 1965 were prepared specifically for the planning purpose for which they are intended. Thus they reflect the normal trend picture of the economy, rather than the actual situation in 1965. While it is possible to distinguish over a long period of years what is called the trend, the figures for actual years will vary from the trend to a greater or lesser extent for a variety of reasons. Fiji, for instance, experienced a sugar boom in 1963 which has affected export earnings as well as general expenditure and imports since that time, and the effects of which have not dissipated themselves even now. Sugar export proceeds in 1964 were, at about £F18 million, about one-third higher than they would normally have been, and this in turn raised the volume of imports with a time lag. It would clearly be unrealistic to use the actual figures for a particular year as a starting point for planning if they deviate from the long-term trend.

9. In the estimates given in this document, sugar export proceeds are valued at a notional average export price of £F35 per ton, reflecting the relative proportions sold at the preferential Sugar Agreement prices and at the free market prices, and imports were valued in accordance with an established long-term trend rising at 8·3 per cent. per annum.

10. Table I, " Resources and Final Demand in Fiji 1965," provides a comprehensive view of the Production Sectors and of the Demand Sectors and their interaction. The Production or Resources Sectors are shown across the Table from left to right, and the Demand Sectors can be read down vertically.

11. Amounts in the Production Sectors are shown at " factor costs." This denotes the net values created by each sector and excludes the goods and services bought by a sector from the other sectors; the net values are represented broadly by the wages, salaries and profits earned in a sector. This accounting device ensures, among other things, that double counting of goods and services is avoided.

12. The Production Sectors have been somewhat re-arranged on a functional basis. Public Works Department has been taken out of the Sector Administration; the building and engineering activities of that Department are included in the sector " Construction and Engineering," and the Public Utility Electricity and Water Services are shown in the sector " Electricity and Water." Posts and Telegraphs Department is included in the sector " Communications." The reason for these changes is that the activities mentioned represent services not provided free by Government but paid for by the consumer, it being understood of course that Government itself may be included among the consumers.

13. The Demand Sectors show amounts at market prices, excluding taxation transfers. These are the amounts which the purchaser has to pay; excluding the effect of indirect imposts such as customs and excise duties. It is possible by reading the Demand Sectors, grouped as " Private Demand," " Current Public Expenditure," " Investment," and " Exports," across the Table to see what contribution the various Production Sectors and Imports make to the final value of consumption at market prices.

14. It may be mentioned that the third kind of flow known in National Income Statistics, i.e. income distribution and taxation cannot be read from Table I. Thus the mechanism by which the incomes generated in the Production Sectors reach the hands which spend them is not given. It is, of course, the process of income and taxation distribution, as governed by wages, salaries, profits and taxes, which provides the link between real production and real expenditure. It is not necessary for the purposes of the present planning process in Fiji to study the flow of income streams.

15. A summary of the Production Sectors is given in Table 2. Domestic Production is shown there as linked to consumption, allowance being made for net imports and domestic exports. We see that, assuming a normal trend situation, the import deficit in 1965 would have been £F2·8 million.

16. The economy of Fiji is heavily dependent on foreign trade. About one-half of the domestic product is exported and exchanged for imported materials, consumer and investment goods. Agriculture is the outstanding productive activity, while Manufacturing is to about nine-tenths of its output geared to the processing of sugar cane and copra. Of the invisible re-exports, estimated at £F4·4 million, about £F2·9 million were accounted for by duty-free tourist goods such as transistor radios, cameras and watches sold to overseas visitors but not shown in the trade statistics.

GROSS PRODUCTION AND CONSUMPTION, 1965 — TABLE 2

£F million

A—PRODUCTION SECTORS

Production Sectors	*Production at Factor Cost*	*Net Imports c.i.f.*	*Domestic Exports at Factor Cost*	*Consumption*
Agriculture and Fishing	19·9	1·5	7·7	13·7
Forestry	·9	....	·1	·8
Mining and Quarrying	·8	....	·7	·1
Manufacture	4·8	20·5	3·6	21·7
Construction and Engineering ..	3·0	....	....	3·0
Transport	2·4	....	1·1	1·3
Communication	·5	....	....	·5
Distribution	4·4	....	·6	3·8
Banking and Insurance	·6	....	....	·6
Electricity and Water	·3	....	....	·3
Tourism and Catering	·9	....	·6	·3
Other Services	1·4	....	·4	1·0
Re-Exports (invisible)	....	....	4·4	—4·4
	39·9	22·0	19·2	42·7
Plus—				
Public Administration	2·4			2·4
Health	·8			·8
Education	1·7			1·7
Ownership of Dwellings . ..	2·1			2·1
	7·0			7·0

RESOURCES AND FINAL DEMAND IN FIJI 1965

Excluding Taxation Transfers
£ million

Table 1
Provisional Estimate

1965 Prices

FINAL DEMAND \ RESOURCES	GOODS						PRODUCTIVE SERVICES								NON-PRODUCTIVE SERVICES					IMPORTS ***				EXPENDITURE
	Agriculture & Fishing *	Forestry	Mining	Manufacture	Construction & Engineering **	TOTAL	Transport	Communications	Distribution	Banking & Insurance	Electricity & Water	Tourism & Catering	Other Services	TOTAL	Administration	Health	Education	Rent	TOTAL	Materials	Consumption	Investment	TOTAL	
	FACTOR COST						FACTOR COST								FACTOR COST									MARKET PRICES
PRIVATE DEMAND																								
Food	11.7			.5		12.2	.1		1.3					1.4						.6	4.0		4.6	18.2
Drink and Tobacco	.2			.3		.5			.3					.3						.2	.2		.4	1.2
Clothing									1.0					1.0						1.6	1.0		2.6	3.6
Other Goods		.2		.2		.4			1.0					1.0				2.0	2.0	.4	2.0		2.4	3.8
Housing																								2.0
Services					1.0	1.0		.4		.6	.2	.3	.9	2.4		.1	.3		.4	.4			.4	4.2
Travel and Transport							.9							.9						.6	.7		1.3	2.2
																								35.2
CURRENT PUBLIC EXPENDITURE																								
Administration					.7	.7	.1	.1					.1	.3	2.4			.1	2.5	.5	.1		.6	4.1
Health	.2					.2										.7			.7		.4		.4	1.3
Education	.1					.1											1.4		1.4		.2		.2	1.7
																								7.1
INVESTMENT																								
Public		.2	.1		.6	.9	.1		.1		.1			.3								1.9	1.9	3.1
Private		.4		.2	.7	1.3	.1		.1					.2								2.8	2.8	4.3
																								7.4
EXPORTS																								
Goods and Services	7.6	.1	.7	3.6		12.0	.9		.3				.4	1.6						1.5			1.5	15.1
Tourism	.1					.1	.2		.3			.6		1.1							2.9		2.9	4.1
																								19.2
TOTAL RESOURCES FACTOR COST	19.9	.9	.8	4.8	3.0	29.4	2.4	.5	4.4	.6	.3	.9	1.4	10.5	2.4	.8	1.7	2.1	7.0	5.8	11.5	4.7	22.0	68.9

* Sugar export proceeds valued at £35/ton
** Including Public Works Department
*** Long-term trend estimate 8.3% p.a.

Central Planning Office,
October, 1965

GROSS DOMESTIC CONSUMPTION		49·7
Less—		
Import Deficit		−2·8
GROSS DOMESTIC PRODUCTION ..	46·9	46·9

17. The pattern of Gross Domestic Expenditure is given in Table 3. Gross Fixed Investment accounts for about 15 per cent. of Gross Domestic Expenditure. The term " gross " signifies that no allowance has been made for capital depreciation.

18. Total Gross Domestic Production is shown as £F46·9 million. Since the present population in Fiji is about 450,000, this means an average annual income of about £F100 per head.

GROSS DOMESTIC EXPENDITURE, 1965 TABLE 3

£F million

At market prices excluding taxation transfers

B—DEMAND SECTORS

Private Demand—	
Food	18·2
Drink and Tobacco	1·2
Clothing	3·6
Other goods	3·8
Housing	2·0
Services	4·2
Travel, Transport	2·2
	35·2
Current Public Expenditure—	
Administration (excluding P.W.D., P. & T., Electricity, Water, Public Debt, Pensions and Refunds)	4·1
Health	1·3
Education	1·7
	7·1
Gross Fixed Investment—	
Public	3·1
Private	4·3
	7·4
Gross Domestic Expenditure ..	49·7

Problems

19. It will be well to take stock of the development problems with which Fiji is faced. An analysis of the problems, as well as of the long-term development potential, will help in determining the main lines of policy. In doing so, it is necessary to look thirty years or more ahead because the major problems will condition the course of events in the long run; but they may not necessarily make themselves fully felt in the short or medium period.

20. Some problems are of a basic nature and specific to Fiji. It is with these that this section is concerned. There are other problems which are generic to all developing countries such as education, health, and the evolution of institutions and of a new social and economic framework. This latter kind of problem will be taken care of as part of the more general processes of development, and it is not discussed here.

21. It should be stated that this document deals with economical problems, and not with social or political problems. It is, of course, true that social, political and racial factors have an important bearing on development. It is essential, however, to keep economic and social matters apart for purposes of analysis and to treat them as separate though related issues.

CHARACTER OF NATURAL RESOURCES

22. The total land area of Fiji, of which the two principal islands comprise 87 per cent., is 7,055 square miles, scattered over some 90,000 square miles of ocean. The great part of the major islands is high, steep, broken country, deeply dissected by water courses. Over 69 per cent. and 58 per cent., respectively, of the areas of Viti Levu and Vanua Levu have slopes of over 20 per cent., and only 16 per cent. and 15 per cent. are of lesser slope than 5 per cent.

23. The flat land is to be found in the valley bottoms and delta plains of the main rivers, together with innumerable small flats extending inland from coastal bays up the lesser water courses and often separated by steep headlands. This river pattern of most of the land which is susceptible to mechanical or animal draught cultivation is very obvious. The areas of the moderately sloped and potentially arable land which lie away from the rivers are confined to small, widely dispersed and often inaccessible pockets. Communications to the interior are principally by river and are perilous. Roads are very expensive to build and maintain because of the broken and unstable nature of the country.

24. The prevailing wind is from the South-East. The high central ranges divide the main islands into two clearly defined climatic zones; a very wet zone to the South-East, and a lesser wet zone (with a well developed dry season) to the North-West.

25. All the suitable soils of the wet zones tend to be heavily leached. The fertility of these soils is not high and applications of fertilisers are required to sustain yields. Under the traditional regime of shifting cultivation, cropping periods must be short and fallows long. Replenishment with newly weathered material sustains the fertility of the colluvial soils, and periodical silt depositions that of the alluvial plans and river terraces. These are the most fertile soils of the wet zones of the two principal islands.

26. The stable soils in the drier zones, having undergone less leaching, are inherently more fertile; but this is not to say that they are of high fertility. Lateritic gravels of very low fertility have developed under alternative wetting and drying in the drier zones and occupy substantial acreages, especially on Vanua Levu.

27. There are only 550,000 acres suitable for agriculture. Virtually all of this class of land is already under cultivation. Sugar occupies at present about 150,000 acres and coconuts, a tree crop, an estimated 100,000 acres. Rice, roots, improved pasture, and fallow and rough grazing land account for the remainder.

28. The expectations for further growth in agricultural production from the extension of area are therefore severely limited. The total present value of agricultural production (exclusive of the value added by further processing, for instance, in sugar and copra making) is about £F20 million. It is unlikely that this figure will exceed £F50 million at present prices, in the year 2000 A.D. This serves to emphasise how seriously circumscribed is the available area of potential arable land in Fiji. There is, therfore, every reason for intensifying production from the arable land already in use, and for bringing into arable production all areas of this type not yet so cultivated.

29. Watershed management, water control, drainage and irrigation present significant problems in Fiji. Heavy rainfall, erosion and devastating floods present difficulties. It will be an essential requirement for the proper utilisation of available land resources to solve these difficulties.

30. The conservation of land resources demands a full survey of water catchment and disposal in order to preserve or improve the soil and climatic conditions.

31. Two of the potentially most valuable areas in Viti Levu, Nausori and Navua, are at present inefficiently cultivated. These districts had drainage systems in the past when they were used for sugar cane cultivation. The drainage systems have now fallen into disrepair, and the land is in danger of reverting to swamp unless steps are taken to rehabilitate it and make it fully productive. In view of the shortage of arable land, this presents a basic problem to be tackled before positive development can take place.

POPULATION

32. Population is increasing at a fast rate and the total number of people in Fiji is expected to increase from the present 450,000 to about 1·2 million by the year 2000 A.D. The labour force will grow from 125,000 to about 350,000 over the same period. These projections are based on an assumed annual growth rate of 3 per cent. for the total population. While changes may, of course, occur in that rate, and it is to be hoped that there will be a decline, the figures given should be taken as an indication of the order of magnitude of the problem.

33. The growth of the Fiji economy and the improvement in the standard of living will essentially be governed by the way in which productive employment can be provided for the people.

34. The point has been made that the employment potential of Agriculture is not very high, so that rural occupations will be able to absorb only a small proportion of the increase in the labour force. For instance, if the rural population were to fall from 80 per cent. to 70 per cent. of the total population between now and the year 2000 A.D., about 450,000 additional people or 70,000 households would be looking for work on the land. If each household, on an average, were to be given ten acres of land, the total requirements of the additional rural population would be about 700,000 acres by the year 2000 A.D. Arable land for this number of families will, of course, not be available because the total arable land of around 550,000 acres is already virtually fully occupied.

35. It is clear, therefore, that employment must be found for Fiji's population in other industries, and it will be an essential objective of development policy to find profitable alternative work. It is important to formultate this problem in its full severity.

TRANSPORT

36. One of the main geographical and economic features of Fiji is that its territory is scattered over more than 500 islands, about 100 of which are permanently inhabited. Two-thirds of the population live in the main island of Viti Levu, while the remainder is distributed over the second island of Vanua Levu and a host of minor islands. In the two major islands there are many communities which are not easily linked with each other because of the rugged nature of the country. It is clear that, if satisfactory progress is to be made and the latent economic potential to be achieved, the social and economic life of Fiji must be fully integrated by means of an adequate and efficient transport system. Because of the geography of the country, it is essential that land, sea and air transport services are effectively and economically co-ordinated.

37. Fiji's location in the South Pacific also presents a specific transport problem. It is evident that a small territory placed at large distances from its markets and sources of supply is faced with a special set of considerations. While Fiji's location is in many ways a handicap in its integration in the world economy, it provides at the same time a number of opportunities. Fiji is fortunate in lying on the main lines of sea and air communications across the Pacific. It will be an important development problem to overcome the drawbacks of Fiji's geographical location and to exploit the advantages to the greatest possible extent. The advantages may well go beyond the transport facilities which Fiji can offer as a staging post in the South Pacific. In particular, opportunities exist in the expansion of tourism, in the exploitation of marine resources and in the establishment of service industries.

38. There is no question that the building of an adequate road network constitutes a basic development objective. There is a close connection between transport and economic expansion. Thus the geographical distribution of development potential and the corresponding transport requirements must be jointly considered as a fundamental subject in Fiji's long-term economic advance.

39. Inter-insular shipping is another subject matter which will require attention. The coastlines of the islands are still virtually undeveloped, with very few exceptions. Wharves, coastal roads and storage facilities are lacking or do not co-exist in an effective manner. Ships call at a multitude of coastal settlements and trade on the open beaches; often for very small quantities. Shipping operations are, therefore, slow and difficult, the more so because of the hazardous nature of most of the coasts.

40. Coastlines are generally fringed by coral reefs away from the river mouths. There are barrier reefs off shore, and lateral channels between the reefs are studded with coral heads. The coasts are therefore only navigable by daylight; coast lighting as navigational aid being absent. Ships use their own work boats which are towed long distances from the anchorage. These work boats, manned by extra crews carried on board ship from Suva, often have to wait for rising tides in order to cross the reefs and reach the trading posts.

41. The ships themselves cover a range of types. Approximately 70 per cent. have wooden hulls, and a little over 70 per cent. were built before 1949 or are of unknown age. Ships deteriorate fast in these waters, and those older than ten years are often unecomomical to operate.

42. The development of the smaller islands and of Fiji as a whole will be greatly helped by the institution of efficient, regular and economic shipping services. Much of the existing productive potential is at present inhibited by the lack of proper inter-insular transport facilities, and it will remain so until good facilities give to producers the necessary assurance that they can bring their produce to market. A closer economic and social knitting-together of the islands will help in bringing about a more balanced and integrated development of the archipelago, and incidentally prevent the emergence of depressed areas and the flight of population from the less favoured localities.

STRUCTURE OF THE ECONOMY

43. The main activity providing employment and income has been Agriculture, but the natural resources supporting it give little scope for increased employment in the future. Other industries will, therefore, have to be developed to absorb the growing population and improve the standard of living.

44. Fiji depends at present on two export crops for its foreign exchange income. Total exports are running at a level of about £F20 million, of which sugar accounts for about £F12 million and coconut products for about £F3 million. The world market for sugar is very volatile and sugar prices are subject to violent fluctuations. The Fiji economy is, therefore, exposed to external influences to an unwelcome extent. While there is still scope for considerable expansion in the production of sugar and coconut products, it is certain that these two commodities will not be able to support the long-term development of Fiji.

45. It will be necessary, therefore, to find new economic activities and to diversify the structure of the Fiji economy. It is also clear that the new industries will have to be sought mainly outside the Agricultural Sector.

46. In recent years, impressive economic growth has occurred along the traditional lines of production, but this cannot continue much longer. The time in which expansion can be sustained from traditional activities is fast running out.

Long-Term Development Perspectives

47. In order to decide on the right course of policy both for the present and the future, it is necessary to look at the true long-term development potential of Fiji. This will help to distinguish between activities which offer only a limited perspective and those which are capable of making major contributions to the national income in the more distant future. It must be freely acknowledged that there is never enough information to discern clearly the shape of the future. But it is also true that long-term planning is more than idle speculation.

48. It is the custom to draw up development plans for periods of about five years. It has been found from experience that this is the time-span for which specific and practical forward decisions can be made, allowing sufficient time for proper designing, financing, staffing and execution. It is, however, important to look beyond the five-year period and make sure that short-term policies are appropriate to a more comprehensive long-term strategy. This is particularly so in developing countries which are at the beginning of the road and have still to make a basic assessment of their condition and resources.

49. For the purposes of perspective planning in Fiji, the year 2000 A.D. may be taken as the focal point. The assessments and estimates for that year are not firm forecasts. They are speculations meant to provide indications of the possible structure of the Fiji economy as related to population trends, available natural resources and demand projections.

50. The assumptions may be made that population will increase from 450,000 to 1·2 million between now and the year 2000 A.D., and that national production will rise from about £F50 million to about £F350 million. These figures imply an average annual growth rate in National Income of 6 per cent. They also signify that the National Income per head of population would rise from the present figure of £F100 to £F300. These are ambitious figures.

51. The next and more revealing step is to hazard a guess of the likely composition of national production in the year 2000 A.D. If this can be done with sufficiently good reasoning, it will be most useful in giving direction and purpose to action.

52. The following table presents a summary of the estimates for national production in the year 2000 A.D. It will be seen that the share of primary industries in total national production is expected to be no more than 24 per cent., while that of secondary industries is projected with 34 per cent. and that of tourism with 10 per cent.

TABLE 4

COMPOSITION OF NATIONAL PRODUCTION 2000 A.D.
PROJECTION

Sectors	*Net Production Factor Cost £Fm (1965 prices)*	*Per Cent of Total Production*
Primary Industries—		
Agriculture—		
Sugar cane	£10	
Coconut	5	
Rice	5	
Roots	11	
Cocoa/Coffee	3	
Beef/Dairying	4	
Bananas	2	
Others	10	
	50	
Forestry	25	
Sea Resources	..	
Others	10	
	85	24
Secondary Industries—		
Forestry Products	100	
Sugar Milling	10	
Others	10	
	120	34
Tourism	35	10
Administration	35	10
Others	75	22
Total	350	100

53. According to these estimates, Fiji's main export earners in 2000 A.D. will be:—

	£Fm
Wood Products	100
Sugar	20
Tourism	35
	155

54. The indications are that Forestry and Forestry Products, Tourism, and the exploitation of Water and Marine Resources are likely to provide the major lines of development on which Fiji will depend to earn its living in the long run.

LAND USE

55. The broad division of Fiji's land area by Land Use potential is shown in the following table.

FIJI LAND USE POTENTIAL ESTIMATE — TABLE 5

	000 *acres*
Arable Land	550
Tree Crops and Grazing	900
Forestry and Grazing	1,400
Forestry	1,350
Conservation	300
	4,500

56. The actual Land Use in 1965 may be estimated as follows:—

ESTIMATED ACTUAL LAND USE 1965 — TABLE 6

	Acreage	*Production*	
		Volume	*Value*
	000 *acres*	000 *tons*	£Fm.
Arable Land—			
Sugar	151	300	12
Rice	32	13	1·3
Roots	36	125	3·7
Coconuts (60 per cent. of total)	115	29	1·8
Improved Pasture (butterfat)	36	1·3	1·5
Other Arable	11		
Fallow, Other Arable, Rough Grazing (beef)	169	1·7	0·4
	550		20·7
Tree Crops and Grazing—			
Coconuts (40 per cent. of total)	77	17	1·1
Bananas	5	11	0·5
Cocoa	3		
Pasture	30	beef included above	
	115		1·6
Grazing and Forestry—			
Stock-keeping	20	notional	

57. The next table attempts to indicate the likely pattern of Land Use in the year 2000 A.D.

PROJECTED LAND USE 2000 A.D. — TABLE 7

	Acreage	*Production*	
		Volume	*Value*
	000 *acres*	000 *tons*	£Fm.
Arable Land—			
Sugar	200	500	20
Rice	60	65	5
Roots	70	340	11
Coconuts	115	43	3
Improved Pasture (butterfat)	60	2·2	1
Other arable and fallow	45		..
	550		40
Tree Crops and Grazing—			
Coconuts	130	50	3·5
Bananas	10	35	1·5
Cocoa	30	5	1·0
Coffee	30	7	2·0
Dairying (butterfat)	300	4·0	2·0
Beef Production (fattening)	200	2·3	·5
	700		10·5
Grazing and Forestry—			
Extensive Beef Production	250	2·3	·5
Beef Breeding	450	..	..
Forestry	570	945	35·0
	1,270		35·5
Forestry	1,350	2,235	80
Conservation	300		
	4,170		

58. It is expected that surer foundations for those projections will be laid through the technical and economic studies being planned for the period 1966–1970. It may be accepted that the projections will be modified and improved.

AGRICULTURE

59. It seems that agricultural output at factor cost, that is the net value of output in Agriculture, will rise from the present level of £F20 million to about £F50 million by 2000 A.D.

60. The limiting factor is the scarcity of arable land. Of the 550,000 acres classified as suitable for Agriculture, one may expect that by the end of the century, 200,000 acres will be under sugar cane, 60,000 acres under rice, 70,000 acres under roots, 60,000 acres under improved pasture and 100,000 to 120,000 acres under coconuts. As regards coconuts, it might be remarked that tree crops should preferably not be grown on arable land; however, an estimated 115,000 acres of arable land are at present under coconuts and seem likely to remain so.

61. There will also be a certain amount of beef and dairy production from land classified as suitable for Tree Crops and Grazing. One may assume that 500,000 acres out of a total 900,000 acres of this class of land will be devoted to livestock products. Some beef production can also be expected from a third class of land, namely, Grazing and Forestry. Perhaps 700,000 acres (out of 1·4 million acres) may be used for this purpose.

62. It will be seen that the value of output from cocoa, coffee and bananas will not represent a major contribution to national production.

63. In making these broad assessments of production potential, it is not intended to decry the usefulness of minor agricultural products, or indeed Agriculture as a whole. It is needful to pursue every opportunity for increasing production, developing new products and increasing productivity. But it is important to distinguish the major long-run opportunities and to make sure that they are not neglected in the pursuit of minor short-run objectives.

64. The projections for output in the year 2000 A.D. are based on forecasts of domestic demand as far as root crops, rice, beef production and dairying are concerned. For the remainder of the agricultural products, the availability of land or markets is taken as the limiting factor.

FORESTRY

65. It seems satisfactorily established that Forestry and the further processing of Forestry Products offer, on present knowledge, Fiji's major development potential. Although it has been known for some time that Fiji provides scope for Forestry, the realisation of the magnitude of the potential is probably new.

66. Fiji is endowed with all the necessary conditions in the way of suitable land, favourable climatic and ecological conditions and suitable quick-growing species tested under local conditions. It is estimated that there are up to 3,000 square miles of land which have no competing agricultural demands and could support a planting programme of up to 50,000 acres per annum of Softwoods and Hardwoods. The produce from plantings would have an annual export value of at least £F20 million as roundwood at present day prices, and if exported as processed products would produce annual earnings of more than £F100 million.

TABLE 8

FORESTRY POTENTIAL—YEAR 2000 A.D.

Product	Total Land Potential (acres)	Tree Rotation (years)	Annual Production Area (acres)	Production per Acre	Total Annual Production	Value per Unit	Total Value £F millions
(1) Hardwood timber ..	640,000	35	18,000	2,000 cu. ft. (sawn) ..	36 m. cu. ft. sawn ..	£70 per 100 cu.ft.	£25·2
(2) Softwood timber ..	550,000	25	22,000	3,000 cu. ft. (sawn) ..	66 m. cu. ft. sawn ..	£50 per 100 cu. ft.	£33
(3) Pulpwood, etc. ..	730,000	15	49,000	3,000 cu. ft. round-wood (= 23 tons pulp).	147 m. cu. ft. round-wood (= 1.13 m. tons pulp).	£53 per ton pulp	£59·9
	1,920,000	....	89,000	.....	.....	.....	£118·1

67. The climate of Fiji, with a rainfall of 70 to 150 inches per annum, is extremely favourable to the growth of trees. Indications are that some of the pines can be grown on rotations as low as 25 years for timber purposes and 10 to 15 years for pulpwood.

68. Because of its insular position, Fiji has been singularly free of all serious tree pests and diseases. Strict quarantine measures can be enforced to maintain this favourable state of affairs.

69. Recent studies into world trends of wood consumption, production and trade reveal that the annual consumption of industrial wood throughout the world is increasing at a very high rate. In the period 1953/55, annual consumption was estimated at 86·8 million cubic metres, and it is likely to reach 185 million cubic metres by 1975—an increase of 240 per cent. Of these totals, pulp products, for which Softwoods play by far the most important role, accounted for 11·1 million cubic metres of roundwood in 1953/55, and this figure is expected to increase to 49·7 million cubic metres in 1975; an increase of 448 per cent.

70. With reference to the traditional suppliers of Softwoods, it has been forecast that in Europe there will be a growing gap between demand and production of pulp and paper. North American requirements will also increase rapidly, and the declining export supplies from that region will be directed largely to the growing markets of Europe. The European region can be considered a potential market for raw and processed materials from the developing regions of the world, as has been shown in the recent F.A.O. paper " Prospects for Increasing Forest Products from Developing Countries," according to which the market for forest products will amount to $1,000 million by 1975. There is also a growing deficit for industrial wood in South-East Asia, South Asia, East Asia and Oceania; the deficit was 1·3 million cubic metres in 1955 and is forecast at 21·6 million cubic metres in 1975. From these trends in the world supply and demand of forestry products, it is evident that producers will find themselves in a favourable marketing position.

71. The envisaged output from forestry plantations in Fiji will be large enough to support a range of processing industries which may be expected to add to the final product five times the value of the basic timber raw material. Such secondary industries would include the manufacture of pulp, paper and board.

72. The employment effect of a Forestry Industry on the scale envisaged will be very significant. Going by the analogy with New Zealand, 96 acres of forest provide work for one man. Included in this ratio is work in Forestry itself, as well as employment in the primary processing industries such as milling and the production of pulp, paper or board. In Fiji there is the possibility of putting 2 million acres under trees. At the ratio of, let us say, one man per hundred acres, this would mean a total employment of 20,000 men in Forestry and ancillary industries.

TOURISM

73. Tourism can be expected to become a major industry and source of income in Fiji. At present, tourism contributes about £F1 million net to domestic production, or about 2 per cent. of the total. This proportion is likely to grow significantly.

74. Fiji is now being visited by about 40,000 tourists. Projections have been made by tourist consultants, according to which this number will rise to around 160,000 by 1975. For the purposes of long-term policy it may be assumed that the number of tourists will rise to 1 million by the year 2000 A.D.

75. If tourists will stay an average of seven days in Fiji and if it is assumed that the net income retained in Fiji is £F35 per visitor, i.e. £F5 per day, then Fiji's total net income from tourism will be £F35 million. These are, of course, conjectural figures put forward with the object of quantifying the matter.

76. It is interesting to speculate on the implications of the above assumptions. One million visitors, staying an average of seven days, will require 25,000 beds, assuming an occupancy rate of 80 per cent. This would represent 125 hotels having on average 200 beds each. The present number of hotel beds in Fiji is about 1,000. Investment expenditure required for the creation of 25,000 beds would be upwards of £F100 million.

SEA RESOURCES

77. A further development potential must be considered which may provide Fiji with a very large but at present incalculable income in the future. Reference is made here to the exploitation of sea and inland water resources.

78. There is every indication that the potential of the oceans will be developed to become one of the world's main natural resources. With the increase in world population and the growing strain on world natural resources, mankind will turn its attention more and more to water as a resource to be exploited, both for food and industrial materials. Fiji is well situated in the midst of the largest ocean to take advantage of such prospects. In envisaging such possibilities, it is necessary to break away from the conventional attitude to fisheries.

79. A considerable amount of basic and applied research will have to be undertaken before the water potential can be realistically assessed and technologies developed for its exploitation. Such research will take many years to produce results, and it will require finance, facilities and staff. The point to be made is that Fiji has the opportunity of participating in a new technological phase based on a natural resource of which Fiji has an abundant supply. The exceptional importance of these perspectives to Fiji must be stressed with all vigour, but it is of course impossible at this stage to make any estimate of its likely quantitative significance to the Colony.

MANUFACTURING

80. Prospects for Manufacturing are largely bound up with the further processing of local raw materials such as timber, sugar cane or coconuts. Employment and income created in the processing industries will be of major importance to Fiji.

81. There are also other opportunities for the establishment and development of secondary industries. They will probably be mainly in the fields of building materials, packaging and light consumer industries. Their growth will be governed by the increase in the size and spending power of the population. They will be able to make a very useful contribution to the economy by cutting imports and transferring employment from former overseas suppliers to Fiji. The domestic market should, therefore, be kept under constant review in order to identify industrial openings as they occur.

82. While there seems little immediate prospect in Fiji of setting up manufacturing industries which seek their markets abroad, certain industries which cater primarily for the local market are already exporting on a limited scale, particularly to neighbouring islands. It is to be hoped that this trend will continue, although it cannot be regarded as representing a major development potential.

The Development Plan 1966–1970

83. Development planning is a wider concept than public capital expenditure programming. It covers all Government activities of a recurrent as well as of a capital nature and extends into the private sector of the economy; within the context of the total national resources likely to be available.

84. The evolution of institutions, incentives, education and health are essential to development. Therefore, the " fallacy of misplaced concreteness " must be avoided.

85. It has also to be realised that investment and development can only proceed on the basis of good factual knowledge on natural resources, transport and power surveys, experimental research, economic and commercial data, etc.

86. Much of the basic knowledge on which a sound long-term development policy should be founded is still lacking in Fiji. It must, therefore, be a primary objective to institute the surveys and studies without delay which will provide that basic knowledge.

87. It is suggested, therefore, that the Development Plan 1966–1970 should be in two parts: it should contain—

(1) a Survey Plan, and

(2) an Action Plan.

The Survey Plan is to make provision for " investment in knowledge ", while the Action Plan deals with the detailed purposes and objectives to be pursued during the period 1966–1970.

THE SURVEY PLAN

88. The Survey Plan will include studies into natural resources. There is no question that further investigation into the physical nature of the country is needed. There will be soil, climatic and hydrological surveys. In line with the substantial prima facie potential for timber production, there must be special emphasis on forestry studies. All these surveys have to be accompanied by experimental work because *economic* development potential, as distinct from strictly *physical* classification, is not a static quantity but influenced by factors such as selection of species, fertilisers, water or mechanisation, in short by technology. Thus trial studies and cost-benefit analysis are an essential part of the survey work.

89. Marine Studies and Geological Survey are included in the Survey Plan. Marine Research may pay dividends in years to come. For the time being it will be largely a matter of basic research, and it is not possible to predict where it may lead. However, enough is known to make this a very interesting and promising field.

90. Transport plays a vital role in Fiji; and transportation constitutes an important development facet. It is necessary to promote mobility in order to permit latent potential to be developed. The economics of transport and the proper phasing of heavy investment in transport infrastructure are complex matters which must be jointly studied with the growth of production and population distribution.

91. An end result of the Survey Plan will be the formulation of a Land Use Policy which will take account not only of the development of the natural resource potential as such but also of industrial, tourist and urban requirements.

92. The Survey Plan 1966–1970 is dealt with in Part II of this Report. It will need much bilateral and multilateral technical assistance.

THE ACTION PLAN

93. The Action Plan will be concerned with the action provisions of the Development Plan 1966–1970. It deals mainly with Government expenditure, both recurrent and capital. The Government Sector is of crucial importance in developing countries; Government in Fiji employs about two-thirds of high-level manpower, and it is responsible for about one-half of fixed capital investment. Government's activities will have a decisive influence on Fiji's progress.

94. The Plan establishes a reference framework to which Departmental spending can be related year by year. In defining the main objectives and expenditure pattern of Departments for five years ahead, within the financial resources expected to be available, precision and continuity can be given to Government action. From it can also flow detailed co-ordination between policy aims, financial provisions, and implementing capacities.

95. The Action Plan 1966–1970 is the subject matter of Part III of this Report.

PART II—PRE-INVESTMENT STUDIES

96. It is of great benefit to a developing country to take note of the experience and knowledge which has been gained on development problems throughout the world during the last two decades. Many older concepts have been replaced through the evidence of practical facts. In particular, views on the scope of investment opportunities and on the role of investment capital in the process of economic expansion have undergone revision.

97. One of the outstanding facts in development has been the widespread misdirection and waste of investment capital, and it is surprising how little forethought seems often to have been given to the selection of projects and to the use of the finance which has been available. Thus the scarcest factor has been well formulated policies and projects, rather than capital.

98. This has led to the growing awareness that thorough Pre-Investment Surveys are required both to attract capital and to employ it efficiently. It is not to the advantage of either the donor or the recipient if development capital is less well spent than it might be. It must be recognised that the will and the ability to use development capital effectively are the most potent inducements in attracting it.

99. Fiji, being at the beginning of planned development, is in the position where a whole range of Pre-Investment Studies must be done. Subjects include: Transport, Land Surveys, Forestry, Hydrology, Marine and Fisheries and Geology. As a result of these surveys, it will be possible to formulate a long-term Land Use Policy. It may be hoped that the period 1966–1970 will be a time in which much essential information is obtained to provide a firm basis for future development policy.

Transport

100. Transport presents one of the basic problems of Fiji. Due to the country's size and geographical structure, an efficient and co-ordinated transport infra-structure is an important factor in the development of Fiji.

ROADS

101. Roading has been receiving much attention, but so far no firm long-term policy has been evolved. Both the routing of roads and the standards to which they are to be built has been the subject of discussion.

102. The upgrading of roads is a very urgent problem. Some of the principal roads, such as the Suva–Nadi road, are obviously quite inadequate for the traffic they are carrying today. In Viti Levu various main roads have been suggested, such as a road linking the Sigatoka Valley with Nadi, and a road running diagonally across the island as an extension of the Sawani–Serea road towards the Ba area. In Vanua Levu, four separate routes for a trans-insular road have been suggested as well as the Savu Savu West Coast Road. In addition, there is the problem of building new development and feeder roads.

103. The question of roading in Fiji is a very complex one, and the establishment of priorities in the light of economic requirements and natural conditions is a difficult subject. Valid decisions can only be taken after all the alternative possibilities have been studied.

INTER-INSULAR SHIPPING

104. In the field of inter-insular shipping, it has long been realised that the existing situation is not satisfactory. Economic development in Fiji has been uneven in the past and O'Laughlin suggested, in 1953, that the difficulty and costs of sea transport are perhaps the chief contributing factors in this. Likewise, the Burns Commission recognised the problem, but they were not in a position to make positive proposals. It is clear that in an island group such as Fiji, an adequate shipping service is essential in order that the region can work as an economic unit. It is necessary, therefore, to know what the problems are so that constructive policies can be formulated.

105. Present shipping services are subject to delays from weather, and earnings depend on fluctuations in the amount of cargo available. Working methods reduce the earning capacity of many vessels and increase their voyage costs. There is little co-ordination between feeder services and a main fleet.

106. Earnings in shipping are seldom high and competition between owners dilutes the work available in some regions, leading to rate cutting. To offset loss of earnings, vessels tend to overload with passengers and, where possible, with cargoes. Replacement is only achieved by buying old vessels and the high cost of repairs reduces earnings further. With rising costs and more stringent service requirements, it is no longer advisable to continue this type of replacements.

107. An efficient inter-island shipping service will have to play an important role in achieving growth and development. Increased copra production, diversification of agriculture, and other opportunities for earning money in places outside Viti Levu is increasingly dependent on transport. A rising living standard in the islands will undoubtedly be reflected in a demand for a greater share in the social, educational and economic facilities which have tended to concentrate at the main centres. This demand can be met in part by providing safe scheduled services.

U.N. SPECIAL FUND SURVEY

108. The United Nations Special Fund has approved a request by the Fiji Government for a Pre-Investment Survey of the national transport system. The Survey will be of a very comprehensive nature. The total cash cost earmarked in U.S. $635,000, of which U.S. $75,000 will be contributed by Fiji and the balance of $560,000 be provided by the United Nations Special Fund. There will also be counterpart services rendered by Government Departments, such as Public Works Department for technical matters and functional Departments in respect of forecasting transport requirements. The Fiji Government will also provide office space and staff, transport, etc. The notional value of these counterpart services has been estimated at U.S. $415,000.

109. The general purpose of the project is to assist in formulating a phased programme for the development of an efficient and co-ordinated transport system in Fiji. The duration of the project will be three years, and it will cover—

(1) the survey of the geographical, technical and operational conditions of transport,
(2) the study of the best combination of land, sea and air transport means,
(3) the consideration of the most appropriate technical standards, specially in roading and inter-insular shipping, bearing in mind traffic density, initial capital cost and consequential maintenance charges.

110. The first phase of the project will be devoted to the collection and evaluation of existing data with the object of presenting a complete picture of the present state of the transport sector. At this stage, long-range projections of transport needs 30 years ahead will also be drawn up to serve as a framework of reference for short and intermediate-range planning.

111. Following the preparatory phase, a specific high priority programme will be drawn up for implementation in the decade 1966–1975. Among the studies to be conducted for this purpose are a feasibility and engineering survey of the Suva–Nadi road. It is hoped that this will lead to the prompt designing, financing and building of this vital road link. Other studies will be related to general roading, inter-island commerce, wharves and marine facilities, local air strips, and the possible introduction of large shipping container services and coastal Hovercraft services. A phased investment programme will be elaborated after economic and technical evaluation.

112. Finally, semi-detailed projections will be prepared of transport needs, and means of meeting them during the decade 1976–1985. In the light of these studies, the initial long-range plan to 1995 will then be refined and adjusted.

113. To implement the project, the United Nations Special Fund will provide a team including a transport economist, a shipping expert, a road transport expert. two civil engineers, a hydrographer and funds for further consultant services (for instance on tourism).

Land Surveys

114. More knowledge is required on the land resources of Fiji. The survey done by Wright and Twyford some years ago provides very valuable reconnaissance information, but more specific detail is needed for making the best use of the available land potential. Thus a comprehensive inventory of soils, and climatic and hydrological conditions is essential in the drafting of a long-term Land Use Policy. Techniques have been evolved for studies of this kind, including geomorphological studies which divide the country into main Land Systems or Watershed Systems.

115. Elements in the land survey are the demarcation of areas suitable for agricultural development or forestry development respectively, and the determination of areas to be protected and developed for climatic, soil and water reasons.

116. It is important for the conservation of Fiji's natural resources that areas should be designated which should remain permanently under tree cover for reasons of water and soil erosion and flood control. Other areas will have to be recognised as being degraded land which should be rehabilitated.

117. Soil erosion is widespread, particularly in the drier zones where the forest cover has been removed and sites have degraded into a fern-grass complex subject to frequent burning. Apart from the irreplaceable loss of soil, the removal of a protective vegetational cover in water catchment areas can result in serious flooding in the lower lying lands. The years 1964 and 1965 saw very severe flooding along the main water courses, especially in Viti Levu, and measures to minimise this source of danger are urgently needed.

118. The location and ground demarcation of all protective forests in Fiji will be a protracted job. Fortunately, there is no need for demarcation to be done quickly for the whole of the country, as many of the interior regions are unlikely to be affected by forest destructive agencies for some time ahead. However, all areas which should be permanently covered with forest should be recognised as such, with priority attention to be given to those which require immediate attention.

119. In the matter of Soil Surveys, survey programmes are in the course of being formulated in co-operation with the Ministry of Overseas Development in London. In the first place a Land Classification Survey will be required.

Forestry

120. The area in Fiji at present covered by merchantable type forest is approximately 1,600 square miles. Much of this is located in the rugged interior regions of the main islands where accessibility is difficult. A considerable portion of the better and more easily accessible areas has already been worked out completely, and to say that only 60 per cent. of the existing forest area still contains commercial stands of timber in accessible sites cannot be far off the true position. This reduces the area of at present unexploited forest awaiting harvesting and utilisation of its produce to 960 square miles.

121. Although there are undoubtedly some very well-stocked areas included in this 960 square miles, aerial reconnaissance and observation have revealed that some parts of it also consist of a poor type of forest containing a large proportion of unusable forest vegetations such as tree-ferns and palms. While certain regions will have a mean stocking of 600—1,000 cubic feet of useful timber per acre, there will be others with 200 cubic feet or less per acre. It is likely that stocking over the whole of this area will not exceed 400 cubic feet per acre. The situation must be faced that the existing forests of Fiji will be cut over completely by the year 1995, even allowing only for domestic requirements.

122. In view of Fiji's great potential for forestry development, a thorough survey will be needed of all aspects of this industry. The purpose of the Project will be to plan the rapid and rational development of forestry and forestry industries based on Multiple Land Use principles. A suitable request to the United Nations Special Fund is under consideration.

123. A Land Use Survey and Forestry Inventory are basic to the rational planning, development, and implementation of both medium-term and long-term plans and projects. Arrangements for these essential operations are being made with the Directorate of Overseas Surveys, London. It is hoped that the results of those surveys will be available in the near future so that they can be used in the Forestry Pre-Investment Project.

124. Intensive research is required into plantation and nursery techniques as well as into tending operations including thinning and pruning. There is also need to increase the number of species to be planted which, at the moment, are confined to *Pinus caribaea* and *Pinus elliottii in* the grassland arreas and Mahogany (*Swietenia macrophylla*) and the indigenous *Endospermum macrophyllum* in the forested areas. Existing plantations show considerable variations in form and vigour and there is a need, therefore, for work on a tree breeding and improvement programme, including establishments of seed orchards.

125. To ensure that afforestation proceeds in an orderly and systematic manner, it will be necessary for Working and Management Plans to be drawn up. Working plans for the exploitation of existing forests are also required if the limited forest resources available in the Colony are to be utilised to their fullest advantage.

126. It will be necessary to look into the problems of timber processing industries, both primary and secondary, based on the expected volume of raw timber. The possibility of developing pulp, paper and wood-based panel products for home and export demand will have to be studied.

127. There is tremendous potential for Multiple Land Use, employing both forestry and grazing in the badly degraded lands in many parts of Fiji. Much research into pasture grasses, the effects of grazing on tree plantations and soils, etc., needs to be done before the full utilisation of this potential becomes possible.

128. With the present rate of cutting and exploitation of the existing forests in Fiji, it is likely that, unless precautions are now taken, natural forests will disappear in their present form. The creation of Nature Reserves and National Parks is necessary if the future inhabitants of the Colony are not to be deprived of their national heritage in the way of indigenous fauna and flora. The creation of Botanical Gardens, Arboretums, Zoological Gardens, etc., should also be reviewed under this Project Heading.

Hydrology

129. Water Resources form the subject of Hydrological Surveys. Fiji's hydrological network has yet to be established. The control and use of water will be of growing importance, and the relevant studies should be undertaken during the next few years.

130. A proper assessment of land potential and uses can, in many cases, not be made until hydrological problems of drainage and irrigation have been settled. This applies to some of the most valuable regions of Viti Levu, such as Nausori and Navua.

131. Very heavy rain often accompanies tropical storms and causes devastating floods which imperil human life, drown stock and destroy crops on the valley flats. This is a serious impediment to the expenditure of capital on land improvement and to the development of a settled agriculture on improved arable areas.

132. There is enough evidence to show that the Rewa and Navua river systems must be developed for agricultural purposes. It is not feasible to make in advance detailed cost/benefit studies of drainage and irrigation in these two valleys, but there is no doubt on general grounds that these areas must be upgraded and efficiently developed on the basis of water management schemes. It will be suggested that pilot schemes in Nausori and Navua should be set up immediately, say of 300 acres each, in order to obtain the technical and agricultural data needed for a subsequent development programme. It will be part of the objectives of such pilot schemes to make tests of the growing conditions and economics of the different likely crops to be grown in these places.

133. Hydro-electrical potential is another important subject still awaiting comprehensive study. Earlier investigations have proved abortive, but this is not to say that the matter should be considered as closed.

134. The necessary studies are under discussion with the Ministry of Overseas Development in London. They will probably require the services of an hydrologist for two years in Viti Levu and two years in Vanual Levu to complete the basic resource survey. It may be hoped to obtain assistance for this project from either the Ministry of Overseas Development or the United Nations Special Fund.

NAUSORI—NAVUA SCHEME

135. The total area is 23,000 acres of irrigable land; the capital costs should not be heavy in the region of £F200 per acre, or £F4·6 million over the life of the project. Two Pilot Projects and a Pre-Investment Survey are required to be financed either from C.D. & W. funds or the U.N. Special Fund. These studies may take five years. The Pilot Projects may need the services of overseas experts, including probably a drainage and irrigation engineer, a hydrologist, an agricultural mechanical engineer, an agronomist, a soil physicist and an economist.

Note on Drainage and Irrigation in Nausori and Navua

HISTORICAL BACKGROUND

136. Prior to 1939 a centrally organised drainage system managed by the Colonial Sugar Refining Company was in operation in the Nausori area. Farmers who benefited from the scheme were levied an annual rate. During the war, however, the system lapsed and drainage deteriorated, causing a marked decline in productivity of the area. Like Nausori the Navua flats (15–18 sq. miles) once had an extensive drainage system for sugar cane production. Since the closure of the mill in 1922, however, the drainage system fell into neglect, and several thousand acres of once flourishing agricultural land reverted to salt marsh.

137. Provision for an engineering survey of the Navua area was made in the Ten Year Plan of 1950 which allocated a total sum of £F10,000 for the repair and extension of the sea wall, the installation of flood gates and the extension of the drainage system.

138. It was in 1952, however, that grandiose schemes for draining the Navua flats began to be conceived. The impetus came from a world rice shortage in that year. Within the Commonwealth an attempt to encourage rice production was made by an advance of £F3 million from Colonial Development and Welfare funds for approved rice investigation schemes.

139. Following this, recommendations were made for an engineering survey of the Navua and Toga flats. On the basis of these recommendations an application was made for a Colonial Development and Welfare grant of £F90,000 to finance a 3-year survey. Before the application was considered by the Secretary of State, however, a preliminary investigation was undertaken by Mr. McNee (Director of the Drainage and Irrigation Department, Malaya) upon whose recommendation the decision on the Colonial Development and Welfare application would depend.

140. By the time the McNee Report was received two years had elapsed since the United Kingdom Government called for increased rice production, the rice shortage had been alleviated and indeed there was danger of unmarketable surpluses in certain Asian territories. Because of this radical change in the rice supply situation it was then thought unpracticable to embark on any large scale drainage schemes.

141. About the same time interest on drainage of the Nausori area came to the fore owing to the marked decline in sugar cane tonnage produced in the area (averaged 142,000 tons during 1932–39; 91,000 tons during 1950–55), the threatened closure of the Nausori mill owing to the substantial losses being incurred and the need to rehabilitate farmers on other crops should the mill actually close down. But before any action could be taken a comprehensive engineering survey of the area was thought desirable.

142. To undertake this work the Australian engineering firm of Gutteridge, Haskins and Davey was asked to make a survey and draw up plans for a drainage system of Area " F "—an area lying immediately south-east of Nausori Township.

143. During March 1959, Mr. Morrice, Drainage and Irrigation Adviser to the Secretary of State, paid a six-day visit to Fiji. He undertook a reconnaissance of the Nausori area and Navua flats and examined details of the designed system prepared by Gutteridge, Haskins and Davey. The problems he examined and some of his recommendations are indicated below.

144. In 1961 a Drainage Ordinance (No. 20 of 1961) was passed embodying many of the basic administrative requirements indicated by McNee and Morrice.

145. As to the actual scheme to be adopted a modified version of " Scheme B " as designed by Gutteridge, Haskins and Davey was chosen. To implement this scheme the 1964–68 Development Plan allocated £F250,000. In May 1963 an application was made for a Colonial Development and Welfare grant of £F86,648 to finance the scheme, since when the matter has been under discussion.

PROBLEMS ENCOUNTERED

146. For practical purposes these may be classified into:
(1) economics of the scheme;
(2) administrative matters;
(3) technical details.

147. *Economics of the Scheme*

(i) *Economic Justification*—In the early discussions remarkably little was done to make a precise economic justification of the scheme based on current crop yields and prospective returns on completion of a drainage system. Moreover there was need for study of the degree of agricultural diversification possible on completion of the scheme, indicating expected yields per acre of the various crops. The relative weakness of the proposed scheme in this fundamental aspect was a major contributing factor retarding a grant from Colonial Development and Welfare funds, and it also prevented a clear picture of other economic implications.

(ii) *Loan or Grant*—Unless there has been a clear study of the issue indicated above it would be difficult to say whether the scheme should be made a fully economic project with capital investment recoverable from the beneficiaries. While it has been generally agreed that a drainage rate should be charged, the issues at stake are:

(*a*) whether rates should be fixed to enable recoupment of both capital and maintenance costs and if so finance the project from a loan;

(*b*) whether rates should cover only maintenance costs and apply for a Colonial Development and Welfare grant to cover capital expenditure.

(*c*) the capacity of farmers to pay rates under (*a*) and (*b*).

(iii) *Size of Holdings*—Recent evaluations of the capacity of farmers to pay rates have brought up the issue that present patterns of land holdings militate against economic use. Hence there is need for a study to determine viable size of holdings.

(iv) Also associated with the capacity of farmers to pay rates is the question whether wetland or dryland rice is to be adopted. The opinion has been expressed that " if wetland rice is not grown, optimal use will not be made of the land ".

(v) *Increased Value of Land*—In his reply to the application of May, 1963, the Secretary of State suggested that the increased value of land on sale should accrue to Government. It was pointed out, however, that since only about 2·0 per cent. of land within the area comprises freeholds and that native land (38·8 per cent.) cannot be sold, recovery of increased capital value of land on sale is not important.

(vi) *Contractor or Direct Labour*—In the event of implementation of the scheme the question arises whether it should be undertaken by contractors or direct labour under supervision by the Public Works Department.

148. *Administrative Matters*

In all the early discussions on drainage schemes the need for an administrative Board was recognised. Both the McNee and Morrice Reports strongly recommend the setting up of Drainage Boards to administer drainage schemes and have power to levy drainage rates. Absence of this was a contributing factor to the deterioration of the Nausori and Navua drainage systems.

149. *Technical Details*

(i) *Water Table*—The level of water table to be designed is largely determined by:

(*a*) the need of crops. For rice a water table of 1′ 6″ would be sufficient. Other crops however, would require a lower water table of around 3′ 6″;

(*b*) financial considerations. A level of 1′ 6″ would involve a substantial financial savings from one of 3′ 6″, but will greatly limit the agricultural use of the area to a single crop.

(ii) *Problem of Run-off*—This relates to the depth of surface water needed to be removed in 24 hours, based on the intensity and duration of the most unfavourable storm and durability of crops. Mr. Morrice noted that full protection would be uneconomical in the wet climate of S.E. Viti Levu. A compromise will therefore have to be made and a run-off of 1·2″ per day was practical.

(iii) *Field Drains*—Associated with the foregoing problem is the provision of field drains to produce rapid surface water run-off. The issue was whether field drains should be left to the tenants to provide for themselves.

(iv) *Land re-distribution*—This problem arises out of the present pattern of land holdings. Commenting on this Mr. McNee observed, " It will be difficult to work out a design for controlled drainage for rice cultivation on the existing pattern of land holdings. For a controlled drainage scheme to operate efficiently it is essential that the pattern of land layout should conform to the water distribution system ". Endorsing McNee's opinion Mr. Morrice stated that " the only satisfactory way to design a drainage system for the Rewa Valley is to disregard existing property boundaries and pay attention only to topography ". Land redistribution, however, raises problems of native lands and reserves, and the need for compensation where tenants and Fijian owners are rendered landless.

DECISIONS MADE

150. *Economics of the Scheme*

(i) So far the Nausori scheme has been justified on grounds of:

(*a*) preventing land deterioration;

(*b*) need to maintain present cultivable land owing to rising population/land ratio;

(*c*) social obligation to Nausori farmers;

(*d*) general expectation of increased productivity.

(ii) Some analysis of expected crop yields on completion of a drainage system has been made. The conclusions indicate that under the present pattern of land-holdings it would be unreasonable to require farmers to repay the capital cost of the scheme. But, " if holdings of an economic size were envisaged, the whole aspect could change ".

(iii) It appears that a viable holding would depend on whether it is envisaged to grow dryland or wetland rice. Estimates vary between 20 acres or more for dryland rice and 8 acres for wetland rice.

(iv) On the issue of contractor or direct labour, the latter course has been chosen owing to:

(*a*) lack of suitable local contractors;

(*b*) use of contractors may render change in technical details less flexible;

(*c*) need to associate local people with the scheme;

(*d*) any machine purchased for the scheme could be held over for maintenance purposes.

151. *Administrative Matters*

(i) A number of administrative problems have been met by the Drainage Ordinance of 1961. In particular the legislation gave authority for:

(*a*) the Land Conservation Board to declare any area which it deems fit to be a drainage area;

(*b*) setting up of Drainage Boards charged with the responsibility of maintaining and improving drainage in the drainage areas within their jurisdiction;

(*c*) Drainage Boards to assess and levy drainage rates. Annual rates are to be levied at a uniform amount per acre;

(*d*) all land within a drainage area to be liable for drainage rates.

(ii) A Drainage Board had been set up for Nausori, following the declaration of 8,000 acres as a drainage area.

152. *Technical Details*

(i) Since the water table of 1' 6" would limit the agricultural use of the area to only a few crops, it has been decided that water tables of 2' 6" and 3' 6", varying with soil types should be adopted. (Modified " Scheme B".) In this scheme deep water tables should be on better soil types and shallower tables on poorer soils.

(ii) Technical questions relating to run-off raised by the Adviser to Secretary of State on Drainage and Irrigation have been ironed out after consultation with the Staff Water Engineer

(iii) Field drains should be first constructed by the Public Works Department to acquaint farmers with what is required.

(iv) Re-demarcation of holdings to allow drainage system to follow local topography had been agreed upon.

OUTSTANDING MATTERS

153. (i) With the ironing out of technical details for drainage, economic aspects now await final decision. It appears that the economics of the scheme now rest on a final decision:

(*a*) whether to plant wetland or dryland rice;

(*b*) the appropriate size of holdings and crop rotation.

(ii) If wetland rice is chosen then detailed plans for controlled drainage and irrigation will have to be drawn.

(iii) Controlled irrigation will necessitate land re-distribution. Plans will therefore need to be drawn for a scheme of re-demarcation of holdings.

(iv) Finally there is still need for a comprehensive and systematic economic evaluation of the scheme. As a general framework the implications of the scheme as a part of the country's over-all development programme should be considered. In particular, consideration should be given to the role of the scheme in the Agricultural Sectoral Plan, taking into account its contribution to production targets.

NAUSORI WATER CONTROL

154. It appears possible to irrigate in the Nausori area almost the whole of the soils suitable for rice growing in the drainage area—by superimposing a complete irrigation system on the proposed drainage system.

155. Water could be obtained from the Rewa by constructing a pumping station near Verata. This would discharge into irrigation channels built above ground in the spoil from the drainage excavations. There are no insuperable engineering problems involved, and the scheme could be designed in the Water Section of Public Works Department, provided staff is available. However, to give some idea of what is involved the following points should be noted.

(1) The drainage scheme would still be needed, almost unchanged except for the farm drains which would be excluded. It might be possible to reduce some of the channel depths (which were dictated partly by designed water tables). On the other hand it might be necessary to enlarge some of the drains to obtain material for construction of irrigation channels.

(2) It is not possible to use the drainage channels as irrigation. The pumping station and irrigation channels would need to be large enough to give complete irrigation in drought conditions.

(3) It may not be possible and would certainly be uneconomic to provide each of the present separate plots with irrigation water. Plots would either have to be enlarged or irrigation would have to be carried out ignoring plot boundaries. This latter would require strict organisation and discipline of the farmers. It could possibly be achieved on Crown land but perhaps not elsewhere. Within limits the larger the plots the more economic the scheme. It will be appreciated that each separate area irrigated must be surrounded by earth bunds. The smaller the plots, the more bunds required. Siting of bunds should be influenced by contours rather than by plot boundaries, and the bunds and small farm irrigation channels should be done as part of the scheme not left to individual farmers.

(4) The success of any irrigation scheme depends to a large extent on efficient management. In a scheme with many tenant farmers this is particularly true.

156. It would appear that the cost would work out between £20 and £30 per acre. This could only be confirmed by detailed design and estimate, and is of course in addition to the cost of drainage.

Marine and Fisheries

157. Scientific sea farming and exploitation is a subject which has so far been little explored. Fiji is well situated for the study of marine resources in the South Pacific. The results of such research are also likely to make a significant contribution to the economic development of Fiji; it may well be said that the sea is a resource of which Fiji has an abundant supply.

158. Scientific knowledge about the oceans and their resources is unevenly distributed. There are about 240 laboratories in the world for studies in marine biology, fisheries and physical oceanography. Close to 90 per cent. of these are in the Northern Hemisphere. In the tropics and the Southern Hemisphere there are long stretches of coast without benefit of any marine laboratories. Thus serious gaps in knowledge of marine environments are geographic, and they are associated with the lack of research facilities in the areas above which ignorance is greatest.

159. In the long established institutions of Europe and North America the classical research techniques of general marine biology, fishery biology, and hydrography have evolved. In general, these laboratories are approaching the advanced and extremely difficult stage in their studies where they must determine how the various elements of environment which they have examined fit together to provide knowledge on the integrated environment as a whole. A new laboratory can profit by the mistakes which the older ones have made as well as by the principles which they have discovered; however, even in the most favourable conditions a full laboratory cannot be created in one operation. It may begin on a modest scale. From there it would expand provided it were well backed financially from the start, and provided the people who controlled it laid sound plans for its growth.

160. Marine research has many aspects. Resources include invertebrate animals, fishes, reptiles, the marine mammals and sea weeds. As to products to be obtained from the sea, they include sea foods and manufactured products such as protein flours, soil conditioners, pharmaceuticals and insecticides.

161. One of the most profitable lines of research and development will probably be the farming of brackish waters, including mangrove swamps. The only parts of the sea which can be farmed are inshore waterways and estuaries which are well protected from the open ocean. Although such areas are farmed in a few countries, they are completely neglected or even destroyed in many parts of the world. Yet, when properly manipulated, they can produce larger quantities of animal protein than can farmlands. Under average agricultural conditions in the United States, the grains produced on one acre will feed enough livestock to yield around 21 pounds (dry weight) of protein food in a year. With the same kind of care that the farmland requires, that is, careful selection of stock, removal of predators, and fertilising and feeding, a brackish pond can produce more than three times as much flesh as can an acre of land. This is by using present information; what might result if such research were put into brackish farming as has already gone to agriculture, no one can say. At present, production of edible protein (dry weight) amounts to about 50 pounds per acre in certain areas of Indonesia, Formosa, and India (Malabar Coast). Techniques of brackish water cultivation must be adapted to the local fauna and environmental conditions and to local economics and sociology. Pending study of the development potential of brackish water, it might be wise to preserve areas of brackish water rather than destroy them for the creation of relatively small pieces of land, because the consequent loss from devastation of marine animal protein resources may far exceed the benefits of the new land.

162. On the high seas, large quantities of sea food can be expected to occur in certain areas where favourable oceanographic mechanisms bring water to the surface from deep levels where great stores of nutrient salts have accumulated. One of these regions that has been under exploration by the United States Fish and Wild Life Service is the Equatorial Current system of the Pacific. These studies have demonstrated the existence of a band of water 400–600 miles wide which is rich in nutrients, in plankton, and in oceanic pelagic fishes.

163. Two concrete proposals arise from sea farming and marine studies in the context of development plans in Fiji:

(*a*) A survey mission might be invited to assess the potential scope and feasibility of instituting research facilities in Fiji;

(*b*) The proposed University of the South Pacific might include a centre for basic and applied marine research. Such a regional centre would have to be high-powered and well financed to do worthwhile work and attract the right calibre of staff. It would provide knowledge which can only be produced in the Pacific region, and it would also give a hard core of original academic study to the University and thus raise its status.

164. This subject has already been raised with the Higher Education Mission which is formulating the project for a regional University of the Pacific in Fiji. It has also been put forward to the United Nations as a possible source of technical assistance and finance.

Geology

165. The following speculative review of the economic mineral potential of Fiji is presented for long-range planning purposes over a period of one or two decades. It is based on the initial mapping programme which has now covered over two-thirds of Fiji and on recently inaugurated geochemical surveys that have to date covered only a very small proportion of the total area.

166. It is significant that the only appreciable mineral export at present is gold, a low-bulk, high-priced commodity; there are many other rocks and minerals in Fiji however that would, in an economically advanced country, be exploited for either the local or export markets. They can be divided, according to utilisation, into two categories, metallic and non-metallic. Because of the generally higher price per unit weight of metallic concentrates, they have an earlier export potential than the non-metallics which will be mainly (but not exclusively) for the home market.

METALLIC ORES

167. Fiji has a definite undeveloped potential in gold/silver and copper/lead/zinc. Relatively small tonnages of the lower priced ores of iron and aluminium are also available and some manganese ore still remains.

168. *Gold—Silver*—There are sound geological reasons for anticipating that more ore-bodies remain to be discovered in Fiji. A major inhibiting factor has been the depressed price of gold since World War II; this has tended to discourage gold exploration throughout the world and has necessitated widespread subsidisation by governments wishing to preserve existing gold mining industries. Even at present prices, gold is a major export from Fiji; if and when the price is raised, earnings would be substantially increased.

169. Meanwhile it is sound policy to preserve the existing industry and to assist and encourage exploration for additional ore-bodies. The latter step has been initiated with the introduction of geochemical prospecting and diamond drilling by the Geological Survey, thus stimulating joint exploration efforts with the Emperor Company. The immediate target is the Tavua Basin (an old volcanic caldera); the present mine occurs at one point on the contact of this structure, but we now know that mineralisation is extensive at other localities around the contact. It has yet to be determined how much gold occurs in these mineralised areas; the search is expected to take from five to ten years, depending upon the scale of the effort, particularly in diamond drilling. From this immediate programme, known as the Tavua Project, it is not unreasonable to hope that ore reserves and output might be doubled. If in addition the price of gold is raised, as many experts consider to be inevitable, the effect on Fiji's economy would be significant.

170. The next question is whether ore bodies are necessarily confined to the Tavua Basin, or whether there may be other favourable areas elsewhere in Fiji. The answer is highly speculative, but there is now a good understanding of the type of rocks and structures that have proved favourable at Tavua. The next logical step is to select other comparable areas revealed during geological mapping, and carry out detailed field investigations when staff resources permit. This however does not exhaust the possibilities because gold is by no means confined to the Tavua type of environment; the old gold mines at Mt. Kasi and Mistry for example occur in two additional types of geological environment. In due course these will be studied in detail and other targets selected from the resulting data.

171. *Copper/Lead/Zinc*—In Fiji these three base metals tend to be closely associated. The world market for base metals has been favourable for the last fifteen or twenty years, though lead and zinc have fluctuated more than copper. The long-term outlook, especially for copper, remains good. This has led to active exploration programmes by wealthy mining organisations in America, Canada, Australia, Africa, and elsewhere. Although there is still room for skilled individual prospectors in remote unknown territory such as northern Canada, there is no doubt that in general, and particularly in Fiji, systematic exploration calls for resources of finance and skill far beyond local capacity. Therefore the policy of the Geological Survey Department over the past few years has been to attract the interest of competent overseas exploration companies and, following a number of geological liaison visits to Fiji, one such company took out extensive prospecting rights in 1965. As this type of mineral exploration is not only skilled and costly but also financially risky, it is essential that Government should offer all possible incentives and co-operation to companies of this type; otherwise regardless of geological evidence, they will turn their attention to other territories such as Australia where incentives to mining companies are more favourable.

172. The prospects of locating and developing base metal ore bodies in Fiji are considered to be geologically good. Such mineralisation is known to occur in at least four geological environments.

(1) The Udu Volcanic Group of north-east Vanua Levu possesses ore bodies that are on the verge of becoming a mine, and other parts of the Udu Group require exploration as far south as Labasa and Waimotu (Natewa Bay). Unless this is done by an experienced exploration company, however, there is danger of fragmentation.

(2) Extensive areas of west central Vanua Levu are intruded by small plugs of andesite. These areas are considered to be favourable for base metal mineralisation, accompanied in places by gold.

(3) The Sabeto porphyry copper mineralisation has been the subject of field investigation by the Geological Survey; although ore of economic grade has not yet been found, there is scope for extended exploration guided by the geological map which shows a favourable zone trending inland some 50 miles from the west coast.

(4) The whole of the Wainimala Group of southern Viti Levu is worth further attention as it contains numerous indications of mineralisation related to plutonic intrusions, and some known prospects such as Wainivesi, Namosi and Mistry stretching from the east to the west coast.

173. In summary, therefore, even one small but well organised producing mine could make a useful contribution to Fiji's present economy; the existence of undiscovered ore bodies is considered to be geologically probable.

174. *Lower-priced Metallic Ores—Bauxite*—A small deposit of bauxite, the ore of aluminium, has been proved in western Vanua Levu. The grade is satisfactory but the amount is limited; hence the deposit is economically marginal at the present stage. Bauxite differs from the metallics already discussed in that its occurrence is invariably superficial, consisting simply of alumina-enriched overburden. As the company concerned (a competent Canadian group) had made a general survey of Fiji (c. 1959) before selecting this deposit, the chances of future significant discoveries of bauxite are small. Hence exploitation of this kind of superficial deposit, which involves stripping off all the soil, should be carefully weighed against other possible utilisations such as forestry and agriculture, since, with no question of exploration for buried ore-bodies, the mining operation would be a short-term one.

175. *Manganese*—The boom period for small-workers in manganese that occured in the 1950's is not likely to be repeated because, since the material exploited was superficial and easily recognisable, all large and accessible deposits are likely to have been found. But small superficial deposits still remain in the outer islands, for instance the Lau Group. Moreover, the presence of buried manganese ore-bodies cannot be excluded; the Geological Survey plans when possible to carry out a research programme to investigate the relationship of manganese ore to the ores of iron and base metals; we suspect that some of the superficial manganese deposits are in fact gossans. If this is the case they would be valuable guides to buried ore deposits of other metals. This research requires a co-ordinated field, laboratory and drilling programme. As a side-product of such investigations, buried deposits of manganese might well be revealed.

176. *Iron*—The chances of locating a major ironfield in Fiji are negligible, but several small rich deposits are already known, and small quantities have actually been exported by a Japanese trading company. The ore bodies concerned are metasomatic, and hence are not superficial. Their occurrence is linked genetically but loosely with base metal ores. Hidden deposits can be located by magnetometer surveys. Hence it is quite possible that small but rich iron-ore deposits of this type remain to be discovered. The iron-rich dune sands of Sigatoka, on the other hand, although of ore-grade, are superficial; their exploitation is dependent upon development of transport and bulk handling facilities.

NON-METALLIC MINERAL DEPOSITS

177. These can be subdivided into rocks or minerals used for constructional purposes, non-metallic minerals used as raw material in industry, fertilisers and fuels.

178. *Constructional materials*—These are bulky, low priced materials suitable usually for only local markets. Fiji is well endowed with hard rock for road building and heavy aggregate. Coral reef and pumice, both abundant in Fiji, should be considered for low-cost road surfacing, transport distance being a crucial factor. Gravels, heavy sands and clays are also plentiful. With abundant mudstone and superficial clays, there is much scope for development in brickmaking and ceramics, while higher priced special clays such as montmorillonite and bentonite may also be present as bedded strata, in which case an export trade is possible. Pumiceous deposits on both the main islands offer great scope for constructional use, for road surfacing, building blocks and lightweight pozzolanic aggregate; and an export trade to Australia is possible. Reef limestone and mudstone are already being utilized for cement manufacture.

179. *Industrial Minerals*—Apart from the ubiquitous coral reefs, there are useful deposits of bedded limestone in Viti Levu suitable for agricultural and industrial use. Barytes is associated with certain iron ore deposits and rich concentrations may be present underground. Gypsum is reported to have been encountered in diamond drilling in north-east Vanua Levu, in association with base metal deposits.

180. *Fertilisers and Fuels*—Valuable phosphate deposits occur in the Lau islands and their utilisation for local agriculture is likely once transport and handling problems have been overcome. The material occurs superficially and the total quantity is strictly limited; hence, since removal of soil and overburden is entailed it is evident that exploitation must be controlled by Government and weighed against the long-term benefits likely to ensue for agriculture in Fiji.

181. Thin beds of coal have been encountered in the Upper Tertiary of Viti Levu, but the quantities so far known at the surface are very small. The presence of thicker seams underground obviously cannot be excluded. There are no known signs of oil or natural gas in Fiji, but no theoretical reason is known to disprove its occurrence in consolidated sediments ashore or off-shore.

CONCLUSION

182. The mineral industry in Fiji is in an early stage of development and only a very small proportion of its full potential has been realised. Metallic concentrates for export are of principal interest at present and it is these that require the greatest amount of skill and risk capital. All possible steps should be taken to preserve the existing gold mining industry.

183. In the metallic field particularly, it is important that Government should aim at encouraging exploration by well established and experienced companies, avoiding fragmentation or uneconomic competition, and providing incentives to ensure that profits should be ploughed back into the mineral industry, particularly for further exploration. The alternative is rapid depletion of reserves without corresponding exploration for new deposits.

184. Deposits that are at present uneconomical will become workable as progress is made in transport and other generalised fields. General economic development will automatically stimulate local demand for constructional and industrial rocks and minerals. The degree of risk and skill required in the non-metallic field is much lower, and it is suitable for local enterprise.

Land Use Policy

185. The concept of a Land Use Policy cannot be implemented overnight. It will obviously take time to gather together the results of the various studies and surveys, to evaluate them in conjunction with each other and to formulate policy for subsequent action. It may be hoped that the fear of " perfectionism " will not stand in the way of doing the relevent studies which by their very nature will take a long time to complete. None of this need serve as an alibi for current inaction. It should be possible as a result of land use studies to obtain an increasingly precise picture of the use to which the various geographical parts of Fiji are to be put.

186. The various studies and surveys on natural resources are to lead up to the formulation of a long-term Land Use Policy. It is the purpose of such a policy to enable the best economic use to be made of the country's total natural resources. It will be wise to consider land use, and this term is meant to include the use of water and marine resources, under the widest angle. It will cover conservation, agricultural and silvicultural development, mining, the designation of industrial and holiday areas, rural and urban planning, and the related subject of transport. It will be advisable, therefore, effectively to co-ordinate all the relevant bodies in a well-defined consultative, policy-making and administrative structure. The present situation is not entirely satisfactory in the formation of policy and in the execution of policy.

187. While the process of establishing a Land Use Policy goes forward, one hopes with undue haste but also without undue delay, current development work must of course continue. Interim decisions on the development of natural resources have to be taken, and they have to be taken in the light of the best knowledge at present available. This will apply specially to the period of the Development Plan 1966–1970. No very serious harm need be expected from this because in many fields of development the point of critical decision as between competing alternative uses for given natural resources is still some way off.

188. An agricultural Land Use Policy in the narrow sense cannot be based on a rigid classification of soil types. Practical decisions on the actual best use of land can only be taken in principle when two distinct kinds of studies have been made:

1. Soil Surveys,
2. Techno-Commercial Studies.

The Soil Survey will provide information on the physical nature of the land. The Techno-Commercial Studies, on the other hand, will deal with the growing conditions of agricultural products as related to soil types and cover cultural experimenting and cost-benefit analysis. The Techno-Commercial Studies will also be concerned with the commercial assessment of markets and prices for the various products. They will include market forecasts for home and export sales, and deal with the prospects for the further domestic processing of the primary products.

189. Thus the optimum use of land, specially for agricultural and silvicultural purposes, is not a static concept; and there is no unique combination of products and soil types which can be said to maximise at all times the total value created. Technical factors and technology change, and so do the economic factors as reflected in costs, prices and markets. Each set of factors, such as agricultural techniques or markets, must be separately studied and then combined as appropriate to provide the required answer at the time when it is required.

190. It is important to treat the formulation of a Land Use Policy and the related surveys and studies as a long-term exercise, clearly separate and alongside of current development work. The full benefits will be reaped in years to come. This is not to say, however, that considerable advantages may not be expected from this even in the shorter-term.

191. It should be recognised that the social framework and the land tenure system must be adapted to a suitably formulated long-term development policy. It is clear that the organisation of human society has to be such as to permit the optimum use of available resources. This is not to say that the individual's welfare and personal freedom of choice are to be sacrificed for the sole purpose of maximising physical output. However, the inescapable fact must be stressed that, if an improvement in the general economic and social condition of the people of Fiji is to be achieved, then changes in the existing social structure have to be faced.

PART III—THE DEVELOPMENT PLAN 1966–1970

192. This part of the Review deals with the limits and the content of the Development Plan 1966–1970.

193. The first two sections are devoted to the basic projections which are intended to set the stage for the Plan.

194. The first section, " Economic Projections ", attempts to assess the general growth of demand and production in the economy. It provides estimates by which to judge the feasibility of the Plan as a whole. There is enough growth potential along present lines of development to carry Fiji through the period 1966–1970. However, the pattern of Fiji's economy will have to change in the long run to allow further progress.

195. The second section, " Public Revenue and Expenditure 1966–1970 ", is intended to define the financial limits within which total Government expenditure must be kept during the period 1966–1970. The conclusion is arrived at that Recurrent " Substantive " Expenditure may be allowed to rise by 6 per cent. a year, at constant prices; this will raise the total from £F9·1 million in 1965 to £F12·2 million in 1970. Investment funds should be available for a Capital Expenditure Programme averaging £F4 million during the Plan.

196. The subsequent sections review in some detail the problems and objectives of key sectors.

197. The detailed allocations to Departments and purposes of the total amounts available for Recurrent and Capital Expenditure will be contained in another document.

Economic Projections

198. In order to judge the feasibility of the Development Plan 1966–1970 and to provide a planning framework, global economic projections have been made. These projections serve as a system of reference and help in assessing the significance of individual development activities in the larger context of the economy as a whole.

199. The economic projections are not intended as targets to be achieved, and it must be understood that the figures of demand and production in 1970 do not represent commitments on the part of Government. The projections should be regarded as a tool for ascertaining the compatibility of various simultaneous activities. They are based on the National Income estimates for 1965 given earlier in this document.

200. The initial planning assumptions have been made that Total Domestic Demand will grow at an average annual rate of 5·3 per cent. and Gross Domestic Production at 5·6 per cent.

DEMAND SECTORS

201. Within the overall growth rate of demand, it is assumed that Private Demand will grow at 4·7 per cent per annum, Current Public Expenditure at 6·0 per cent, and Investment at 7·0 per cent. It may be taken that these relative increases are reasonable and reflect proper priorities. Private Consumption per head would rise at a rate of 1·7 per cent., if total population grows at 3 per cent. a year; this would be a satisfactory rate of progress. Current Public Expenditure would increase slightly faster, reflecting the important role of the Public Sector in a developing country. Finally, Investment must take the lead in the pattern of expenditure to create the physical means for an increase in production.

202. Total export earnings are expected to grow at the high annual rate of 7·8 per cent. Arising from these various rates, Total Demand should increase by 6·0 per cent. Table 9 summarises the demand projections 1965–1970.

TABLE 9

PROJECTED TOTAL DEMAND 1965–1970
£F million

AT 1965 MARKET PRICES (excluding Taxation Transfers)

	Demand 1965	*Demand* 1970	*Growth Rates Per Cent Per Annum*
Private Demand			
Food	18·2	22·3	
Drink and Tobacco	1·2	1·6	
Clothing	3·6	4·8	
Other Goods	3·8	4·9	
Housing	2·0	2·5	
Services	4·2	5·4	
Travel and Transport	2·2	2·8	
	35·2	44·3	4·7

	Demand 1965	*Demand* 1970	*Growth Rates Per Cent Per Annum*
Current Public Expenditure	7·1	9·5	6·0
Gross Fixed Investment :			
Public	3·1	4·4	
Private	4·3	6·0	
	7·4	10·4	7·0
Gross Domestic Expenditure	49·7	64·2	5·3
Exports :			
Goods and Services	15·1	20·0	
Tourism	4·1	7·9	
	19·2	27·9	7·8
Total Domestic and Export Demand ..	68·9	92·1	6·0

203. Private Demand is the largest Demand Sector, accounting for 70 per cent. of Gross Domestic Expenditure. It is defined as the spending power left as personal disposal incomes after direct and indirect taxes have been paid. The breakdown of Private Expenditure on goods and services, ranging from food to travel, can only be very broadly gauged at the present time, and the margin of error in it may be substantial.

204. Current Public Expenditure, in the economic sense, is not identical with the Recurrent Public Expenditure as shown in the Annual Budget. For the purposes of national accounting, the services provided by the Posts and Telegraphs Department, and the water and electricity supplies provided by the Public Works Department are treated, to the appropriate extent, as Public Utilities satisfying private demand and paid for by the consumer. Further exclusions from the definition of Current Public Expenditure are the transfer payments such as the servicing of the Public Debt and Pensions.

205. Fixed Investment was assumed to grow at a rate of 7·0 per cent., thus representing a growing share. However, it is not possible to be sure of the required volume of investment. In larger economies, a device called " capital-product ratio " is sometimes employed to assess the capital investment needed to achieve a desired growth rate in production; it does so by establishing a more or less stable functional relationship between investment and the consequential extra output. This technique is not applicable in Fiji because of the small size and flexible nature of the economy. Much will, of course, depend on the actual direction of investment; whether it will be made on directly productive purposes or not.

206. The composition of the export projections is shown in Table 10. Exports of goods and services on the one hand and Tourism on the other are distinguished. The export contributions shown for each Production Sector are at factor cost, meaning the net added value created in the Sectors shown. However, the line " Total " signifies actual export realisations and may therefore be taken to be " at market prices."

TABLE 10

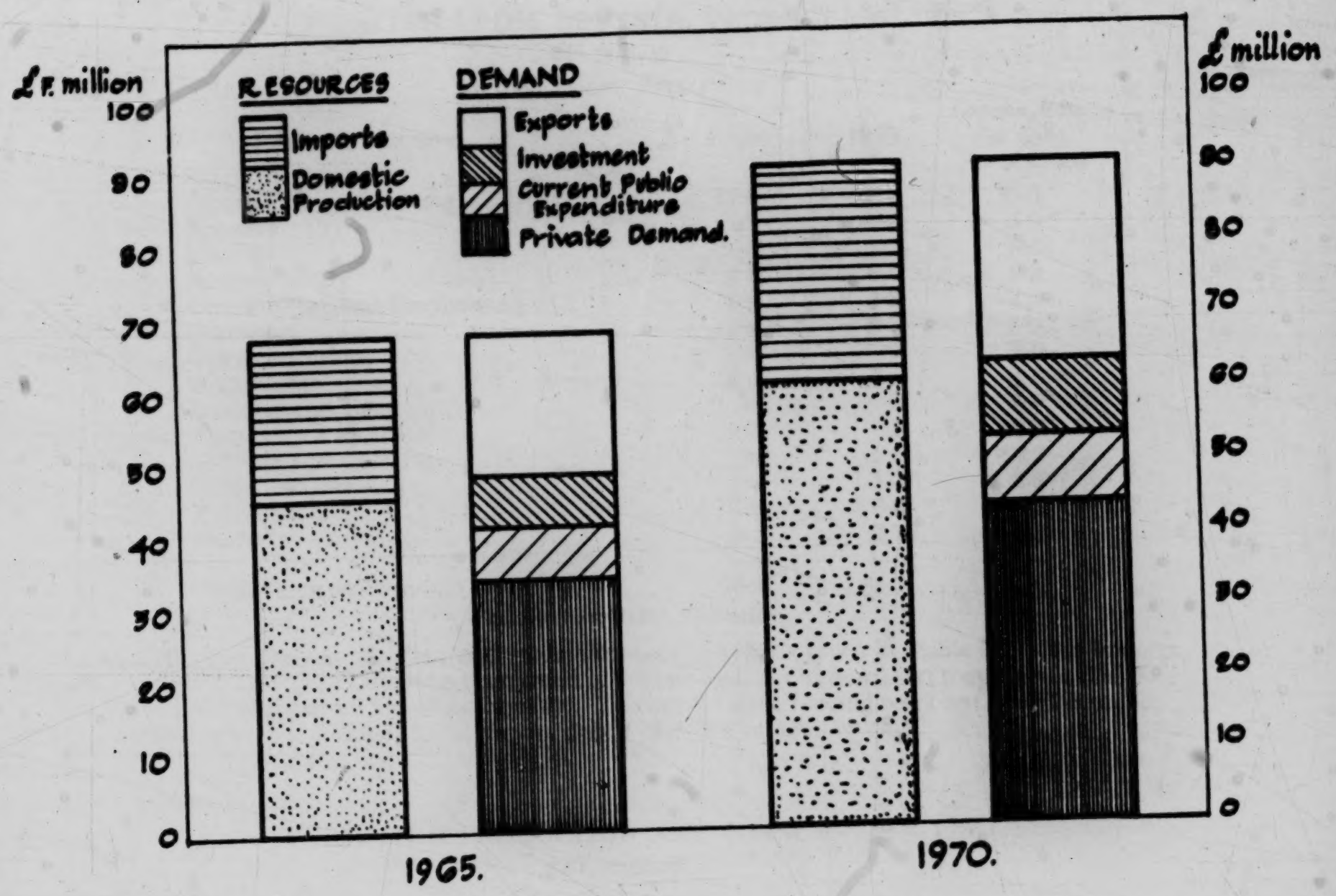
PROJECTED EXPORT DEMAND 1965–1970

(£F million). At 1965 Prices

Production Sectors	1965			1970		
	Goods and Services	Tourism	Total	Goods and Services	Tourism	Total
Agriculture	7·6	·1	7·7	10·1	·2	10·3
Forestry	·1	....	·1	·2	....	·2
Mining	·7	....	·7	1·1	....	1·1
Manufacture	3·6	....	3·6	4·6	....	4·6
Transport	·9	·2	1·1	1·1	·3	1·4
Distribution	·3	·3	·6	·4	·5	·9
Tourism and Catering	....	·6	·6	....	1·1	1·1
Other Services	·4	....	·4	·5	....	·5
Imports	1·5	2·9	4·4	2·0	5·8	7·8
Total ..	15·1	4·1	19·2	20·0	7·9	27·9

207. Some of the assumptions underlying the export projections may be stated. Sugar exports in 1970 are assumed at 400,000 tons, valued at £F35 a ton; this is reflected in a contribution of about £F7·5 million from Agriculture and £F4 million from Manufacture. Exported coconut products are assumed to be equivalent to 45,000 tons of copra in 1970, representing a contribution from the Sector Agriculture of £F3 million and from the Sector Manufacturing of £F0·2 million. As to Tourism, total gross earnings are expected to rise from £F4·1 million to £F7·9 million; however, the Tourist income retained in Fiji, after paying for imported supplies, is anticipated to rise from £F1·2 million to £F2·1 million.

TOTAL RESOURCES AND DEMAND IN FIJI



PRODUCTION SECTORS

208. The Production Sectors are projected to grow at a rate of 5·6 per cent. The breakdown is shown in Table 11.

TABLE 11

PROJECTED GROSS DOMESTIC PRODUCT 1965–1970

£F million

At 1965 Prices, Factor Cost

Production Sectors	1965	1970	*Growth Rate Per Cent. Per Annum*
Agriculture and Fishing	19·9	25·8	5·3
Forestry	·9	1·2	5·9
Mining	·8	1·2	8·5
Manufacturing	4·8	6·4	5·9
Construction and Engineering	3·0	3·8	4·8
Transport	2·4	3·2	5·9
Communications	·5	·7	7·0
Distribution	4·4	5·5	4·6
Banking and Insurance	·6	·8	5·9
Electricity and Water	·3	·5	10·7
Tourism and Catering	·9	1·5	10·7
Other Services	1·4	1·6	2·7
Public Sector*	4·9	6·8	6·8
Rent	2·1	2·7	5·1
Gross Domestic Product	46·9	61·7	5·6

* Administration, Health, Education

209. The likely production and trade situation in 1970 is given in Table 12. Net imports are assumed to increase at the long-term trend of 8·3 per cent. per annum, and they should therefore reach the level of about £F30 million in 1970. The import deficit would work out at £F2·5 million; this compares with a notional trend import deficit of £F2·8 million in 1965.

TABLE 12

PROJECTED PRODUCTION AND CONSUMPTION 1970

£F million

At 1965 Prices

Production Sectors	*Production at Factor Cost*	*Net Imports c.i.f.*	*Domestic Exports at Factor Cost*	*Consumption*
Agriculture and Fishing	25·8	2·1	10·3	17·6
Forestry	1·2	..	·2	1·0
Mining and Quarrying	1·2	..	1·1	·1
Manufacturing	6·4	28·3	4·6	30·1
Construction and Engineering	3·8	..	..	3·8
Transport	3·2	..	1·4	1·8
Communications	·7	..	..	·7
Distribution	5·5	..	·9	4·6
Banking and Insurance	·8	..	..	·8
Electricity and Water	·5	..	..	·5
Tourism and Catering	1·5	..	1·1	·4
Other Services	1·6	..	·5	1·1
Re-Exports (invisible)	..	..	7·8	−7·8
	52·2	30·4	27·9	54·7
Plus—				
Public Sector	6·8			6·8
Ownership of Dwellings	2·7			2·7
	9·5			9·5
Gross Domestic Consumption	..			64·2
Less : Import Deficit	..			−2·5
Gross Domestic Production	61·7			61·7

210. The projections are working assumptions permitting the various magnitudes to be related to each other. The consequences of any variations from the projected figures can be followed through in their effect on other relevant magnitudes.

211. The actual situation in any particular year is rarely exactly on trend; it is either above or below. There is the ever-present chance that fortuitous events, such as exceptional weather conditions or upsets in international marketing conditions, will push the economy off course. Nevertheless, fluctuations round the trend reverse themselves. It is necessary, therefore, in judging performance in any one year to establish its relative position to the trend line.

212. The basic structure of the Fiji economy will not radically change over the period 1965–1970, nor is this to be expected in the short course of a few years. Agriculture will remain the predominant Production Sector. The fastest growing activity among the main producing industries will probably be Tourism. Agriculture, Forestry and Manufacturing are likely to rise at rates between 5 and 6 per cent. per annum.

213. The general picture presented by the projections is a favourable one. There is enough growth potential to carry the Fiji economy through the next few years. The expected increase in production and exports should be sufficient to pay for a reasonable degree of improvement in the standard of living, public services, investment and imports.

214. However, it must be stressed that the projections 1965–1970 cannot be extrapolated into the future beyond 1970. At some point not too far ahead the natural resource base will no longer continue to support the pattern of development expected during the course of the Plan 1966–1970. The growing scarcity of arable land and the increasing pressure of population make it urgently necessary to find and exploit new development opportunities. Fortunately, there are good reasons for believing that Fiji possesses untapped development potential. It would be well to regard the period of the Development Plan 1966–1970 as a period of grace during which the foundations must be laid for further expansion in the more distant future.

POPULATION PROJECTIONS

215. The Statistical Office has prepared population estimates for 1963, 1966 and 1970. These indicate that the overall increase in population is slowing down, after having reached a peak rate of about 3·4 per cent. per annum during the period 1956–1963. Growth over the period 1963–1970 is forecast at an annual rate of 3 per cent. for the whole population.

216. Some tentative estimate of the breakdown of population groups by rural and urban locations is given for 1963. The figures for rural population were used in estimating non-cash agricultural production.

217. There will be a Population Census in 1966 which will provide new data.

TABLE 14

POPULATION ESTIMATES

	Fijian	*Indian*	*All Other*	*Total*
		Mid–1963		
Population—				
Rural	156,308	171,819	18,385	348,512
Urban	22,053	44,401	19,493	85,947
	180,361	216,220	37,878	434,459
Labour Force—				
Rural	39,609	45,990	5,410	91,009
Urban	6,991	12,610	7,390	26,991
	46,600	58,600	12,800	118,000
		Mid–1965		
Population	192,000	232,000	40,000	464,000
Labour Force	....	....	....	126,000
		Mid–1970		
Population	214,000	270,000	49,000	533,000
Labour Force	....	....	....	150,000

Public Revenue and Expenditure 1966–1970

218. It is necessary to establish the limits within which Public Revenue and Expenditure may be allowed to grow during the period of the Plan 1966–1970. This section makes projections which are compatible with the expected expansion of the economy. The projections are at constant 1965 prices.

219. It was proposed that Current Public Expenditure may rise at an annual rate of 6 per cent. between 1965 and 1970, raising the total amount from £F7·1 million to £F9·5 million. These figures are included in the general economic projections of the preceding section. However *actual* Public Revenue and Expenditure is not identical with the definition of Current Public Expenditure used for national accounting purposes. Therefore, adjustments must be made and the following projections conform to actual budget practice.

RESOURCES AND FINAL DEMAND IN FIJI 1970

Excluding Taxation Transfers
£Million

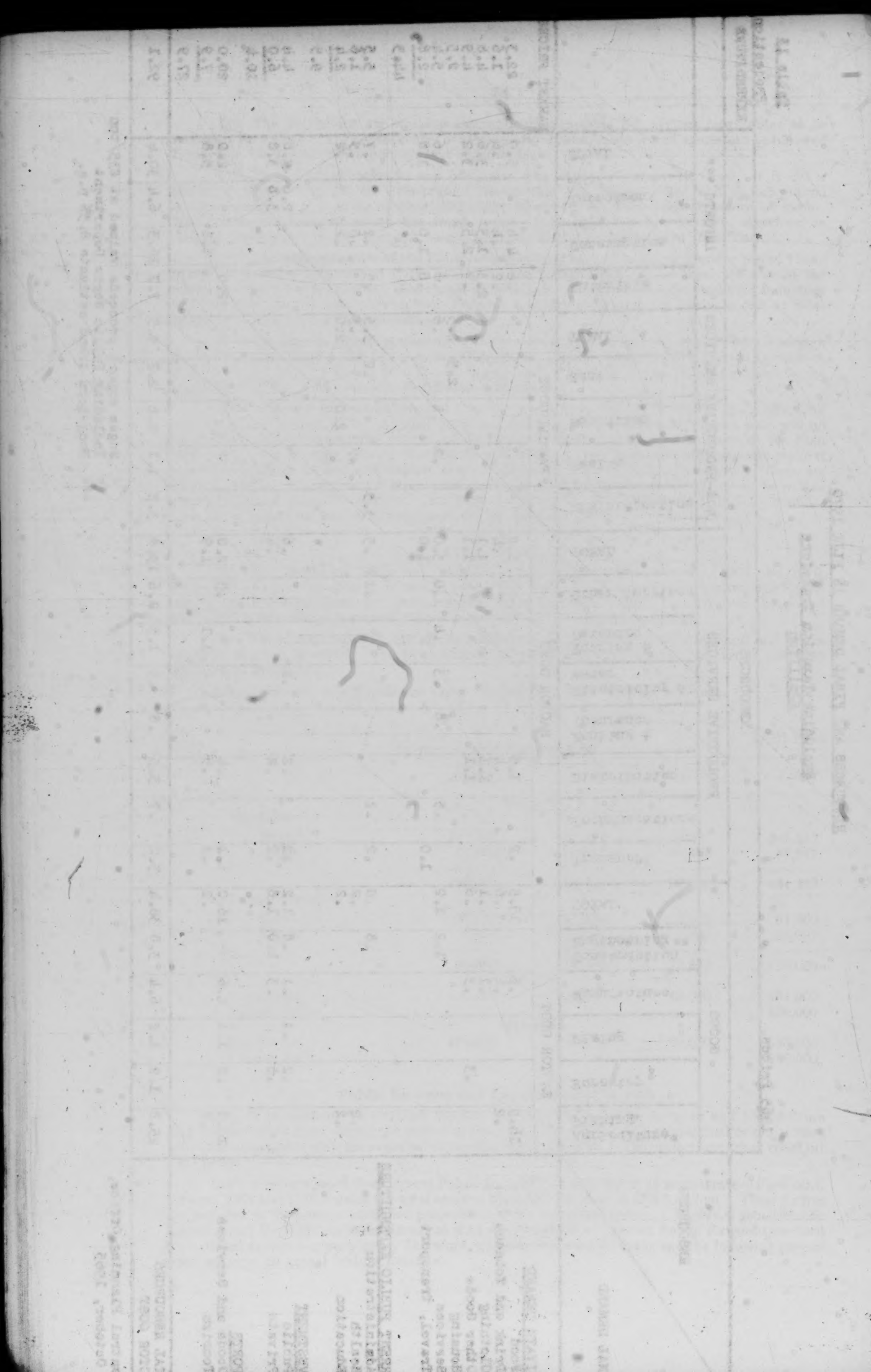
Table 13
Projection

1965 Prices

FINAL DEMAND \ RESOURCES	RESOURCES: GOODS						RESOURCES: PRODUCTIVE SERVICES								RESOURCES: NON-PRODUCTIVE SERVICES					IMPORTS ***				EXPENDITURE
	Agriculture* Fishing	Forestry	Mining	Manufacture	Construction Engineering**	TOTAL	Transport	Communications	Distribution	Banking & Insurance	Electricity & Water	Tourism & Catering	Other Services	TOTAL	Administration	Health	Education	Rent	TOTAL	Materials	Consumption	Investment	TOTAL	
	FACTOR COST						FACTOR COST								FACTOR COST									MARKET PRICES
PRIVATE DEMAND																								
Food	14.9			.6		15.5	.2		1.6					1.8						.6	4.4		5.0	22.3
Drink and Tobacco	.2			.4		.6			.4					.4						.2	.4		.6	1.6
Clothing				.4		.4			1.1					1.1						2.3	1.3		3.6	4.8
Other Goods		.3		.3		.6			1.1					1.1				2.5	2.5	.7	2.5		3.2	4.9
Housing					1.2	1.2		.5		.8	.3	.4	1.0	3.0		.2	.4		.6	.6			.6	2.5
Services							1.0							1.0						.8	1.0		1.8	5.4
Travel, Transport																								2.8
																								44.3
CURRENT PUBLIC EXPENDITURE																								5.5
Administration					.8	.8	.2	.2					.1	.5	3.3			.2	3.5	.5	.2		.7	1.6
Health	.2					.2										.9			.9		.5		.5	2.4
Education	.2					.2											2.0		2.0		.2		.2	
																								9.5
INVESTMENT																						2.6	2.6	4.4
Public		.2	.1	.1	.8	1.2	.2		.2		.2			.6								3.8	3.8	6.0
Private		.5		.3	1.0	1.8	.2		.2					.4										10.4
EXPORTS																				2.0			2.0	20.0
Goods and Services	10.1	.2	1.1	4.6		16.0	1.1		.4				.5	2.0							5.8		5.8	7.9
Tourism	.2					.2	.3		.5			1.1		1.9										27.9
TOTAL RESOURCES FACTOR COST	25.8	1.2	1.2	6.4	3.8	38.4	3.2	.7	5.5	.8	.5	1.5	1.6	13.8	3.3	1.1	2.4	2.7	9.5	7.7	16.3	6.4	30.4	92.1

* Sugar export proceeds valued at £35/ton
** Including Public Works Department
*** Long-term trend estimate 8.3% p.a.

Central Planning Office,
October, 1965



220. Adjustments are made for:

(1) Public Works Department, and

(2) Posts and Telegraphs Department.

These two Departments must be included in the public finance projections, although they are, from a national accounting point of view, shown in the Sectors " Construction and Engineering ", " Communications ", and " Electricity and Water " to the relevant extent.

Adjustments are also made for:

(3) Public Debt, and

(4) Pensions.

These two items are transfer payments and not included in our definition of Current Public Expenditure. However, for the present purpose of projecting budgetary expenditure they must be included.

221. Receipts and payments under the Overseas Aid Scheme for designated Government officers, an incentive scheme for expatriate officers financed by the British Government, are omitted on both the revenue and expenditure sides throughout the financial tables below.

GOVERNMENT RECURRENT EXPENDITURE

222. Table 15 projects Government Expenditure during the period 1965–1970. It incorporates the adjustments described earlier on. Actual total expenditure is projected to rise from £F10·5 million in 1965 to £F14·3 million in 1970. On the assumption that this total of Recurrent Public Expenditure is aimed at, recurrent revenue must be found to cover it; in fact, more than to cover it, if recurrent revenue is to make a contribution to capital expenditure.

TABLE 15

PROJECTED RECURRENT EXPENDITURE 1965–1970

Expenditure	1965 £F*m.*	1966 £F*m.*	1970 £F*m.*	*Growth Rates* 1965–70 *Per Cent. Per Annum*	1966–70 *Per Cent. Per Annum*
Recurrent Expenditure ..	7·1	7·3	(9·5)	6	6·8
P.W.D. and P. and T. ..	2·0	2·2	(2·7)		
	9·1	9·5	12·2	6	6·5
Plus : Transfer Payments ..	1·4	1·5	2·1	8·4	8·8
	10·5	11·0	14·3	6·3	6·8

GOVERNMENT RECURRENT REVENUE

223. Total Recurrent Government Revenue is projected in Table 16.

TABLE 16

PROJECTED RECURRENT REVENUE 1965–1970

	1965 *Revised Estimates* £F*m.*	1966 *Approved Estimates* £F*m.*	1970 *Projection* £F*m.*
Customs	5·8	5·4	6·5
Income Tax	3·1	2·8	3·5
Port and Harbour Dues	·2	·2	·2
Post Office	·7	·8	1·4
Rent of Government Property	·2	·2	·3
Interest	·2	·1	·2
Miscellaneous	·3	·3	·4
Fees, Sales, etc.	1·3	1·5	2·3
	11·8	11·3	14·8

224. According to the above table, receipts will rise from £F11·8 million to £F14·8 million between 1965 and 1970. The rise in receipts from Customs and Income Tax has been estimated with reference to the projections for Gross Domestic Product and Imports respectively; while that for the Post Office and other major revenues has been based on direct forecasts provided by Departments.

225. The rise in revenue between 1965 and 1970, according to the table, would be 4·6 per cent. per annum. However, the rate between 1966 and 1970 would be 7 per cent., revenue in 1965 having been exceptionally high. For comparison, the growth rate was 7 per cent. in 1958–1966, and would be again 7 per cent. in 1958–1970.

226. The projected receipts from Income Tax and Customs are analysed in the following Table 17.

TABLE 17

INCOME TAX AND CUSTOMS RECEIPTS 1963-1970

Years	Gross Domestic Product	Net Imports	Projected Revenue		Ratios		
			Income Tax	Customs	Income Tax	Customs	
	£Fm.	£Fm.	£Fm.	£Fm.	Per cent of GDP	Per cent of GDP	Per cent of Imports
1963	42·6	17·4	2·45	4·66	5·8	10·9	26·8
1965	46·9	25·6	3·1	5·77	6·6	12·3	22·6
1970	61·7	30·4	3·5	6·50	5·7	10·5	21·4

227. The projections for receipts are conservative, given our assumptions for Gross Domestic Product and Imports. The figures for 1965 show the effect of the preceding sugar boom. Customs receipts in 1965 and 1970 are affected by the introduction of duty-free tourist goods, such as radios, cameras and watches, after 1963.

PUBLIC CAPITAL EXPENDITURE

228. Public capital expenditure is projected to rise from £F3·6 million in 1966 to £F4·4 in 1970, giving an average of about £F4 million a year during the Plan period. The feasibility of this assumption may be judged from the Table 18 showing Recurrent and Capital Revenue and Expenditure.

PROJECTED REVENUE AND EXPENDITURE 1965–1970 TABLE 18

	1965	1966	1970
RECURRENT			
Expenditure—	£Fm.	£Fm.	£Fm.
Departmental Expenditure(1)	9·1	9·5(3)	12·2
Transfer payments	1·4	1·5	2·1
	10·5	11·0	14·3
Revenue	10·5	11·0	14·3
CAPITAL			
Expenditure	3·5	3·6	4·4
Revenue—			
General Revenue	1·0(2)	0·7(4)	0·5
C.D. & W.	1·3	1·4	..
Loans	1·0	1·3	..
Others	0·2	0·2	..
	3·5	3·3	4·4

(1) Excluding O/S Aid and Contributions to Capital Budget.
(2) Excludes movements in and out of Reserves.
(3) Excludes Special Expenditure of £0·4 m.
(4) Excludes movements in and out of Reserves.

229. For the year 1970 the estimated excess of Recurrent Revenue over Recurrent Expenditure, totalling £F0·5 million, is transferred to the Capital Budget, and this leaves a gap of £F3·9 million to be filled by external aid or loans.

230. In considering the question of how to cover the forecast gap, it may be borne in mind that about £F0·7 million of total capital expenditure will be for revenue-earning assets in the Post Office and Public Utility Water Supplies. It is a matter for consideration to raise capital for these purposes on a commercial basis from sources other than those which are normally relied upon to cover Government's non-revenue earning infrastructure expenditure. It is also worth remembering that the new Provident Fund will accumulate small savings at the rate of about £F0·6 million a year.

SUMMARY

231. The limits, therefore, to which Government Expenditure may be allowed to rise by 1970 are:

1. Recurrent Departmental Expenditure £12·2 million.
2. Capital Expenditure £4·4 million.

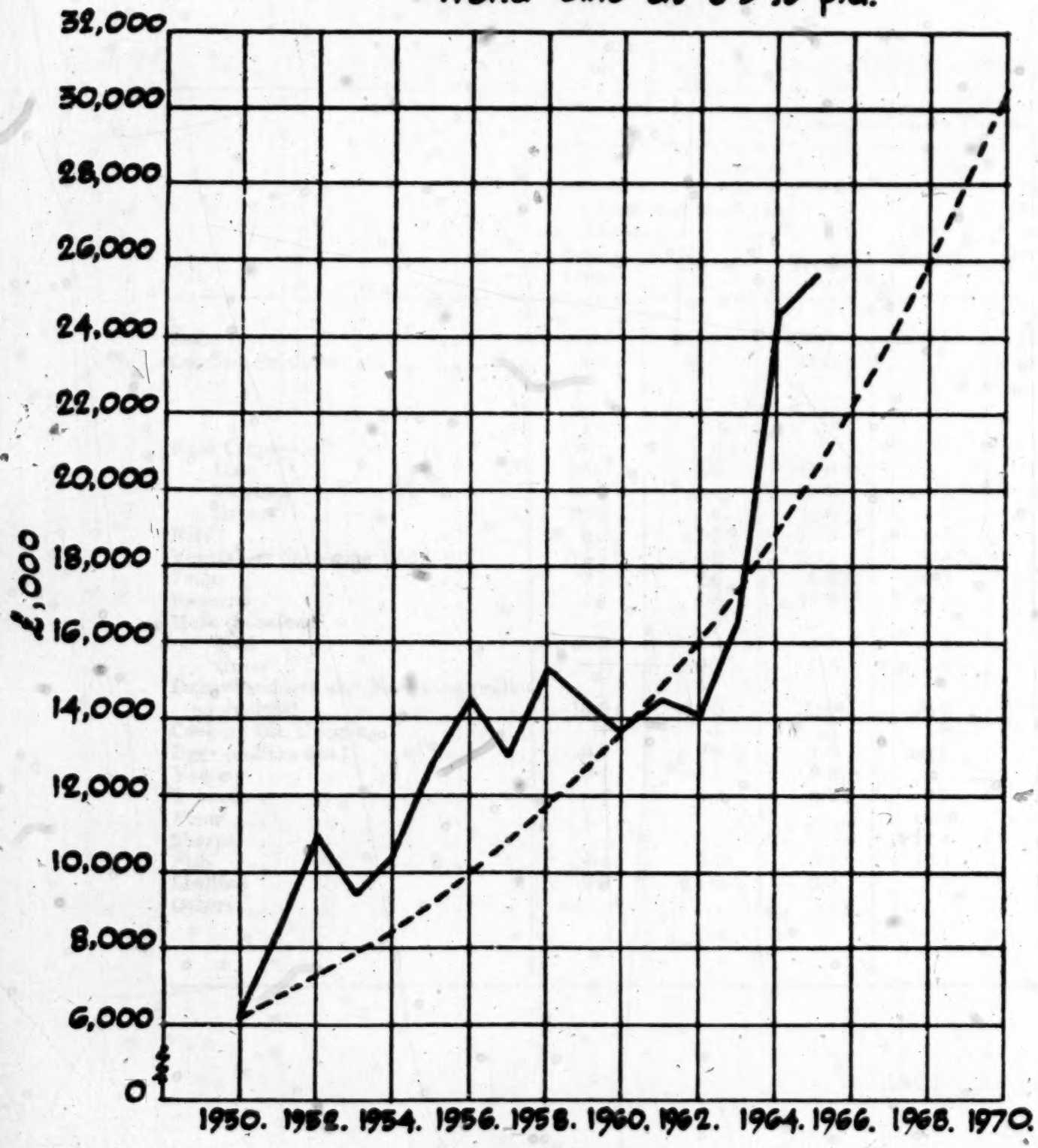
It must be understood, of course, that the above figures are outline planning figures which set limits on total expenditure. The limits may be taken as defining reasonably safe assumptions compatible with the developing economic strength of Fiji.

232. Obviously, there has to be flexibility, and financial policy has to take account of the actual economic circumstances year by year. Thus the brake or the accelerator may have to be applied at various times during the run of the Plan.

233. However, allocations of expenditure to Departments within the general limits set by the projections will help to define longer-term action.

GROWTH IN NET IMPORTS
(AT CURRENT PRICES)

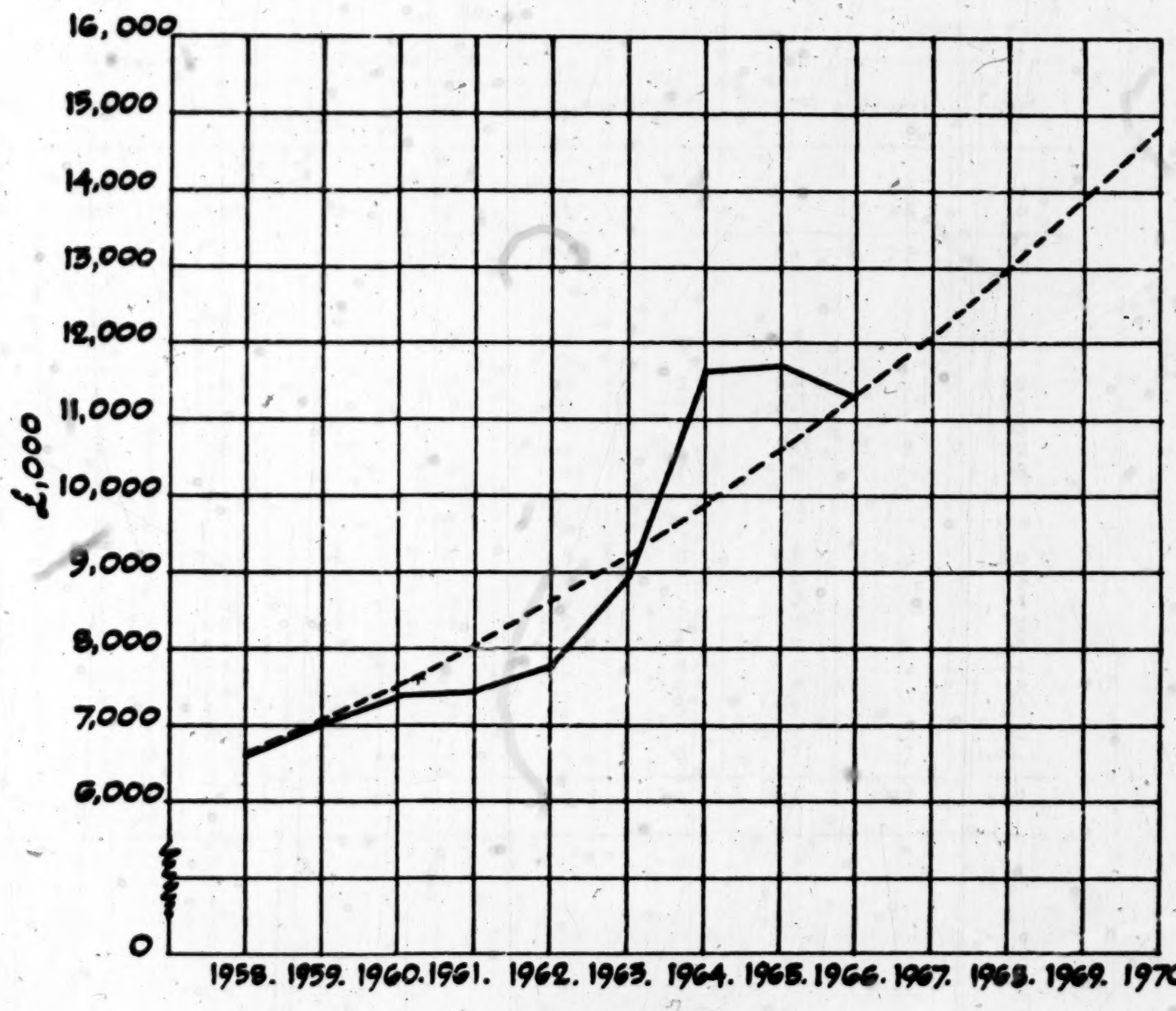
—— Net Imports
--- Trend Line at 8·3 % p.a.



YEARS

GROWTH IN GOVERNMENT REVENUE
(AT CURRENT PRICES)

—— Actual Revenue (excluding O/S Aid Scheme)
---- Trend Line at 7·0 % p.a.



YEARS

CENTRAL PLANNING OFFICE • SUVA

TABLE 19

SECTOR AGRICULTURE, 1983, SUPPLY AND DEMAND

	Quantities—Tons Thousands							Values—£F Million factor cost						
	Supply				Total Supply and Demand	Demand		Supply				Total Supply and Demand	Demand	
	Domestic Production			Net Import				Domestic Production			Net Import			
	Non-Cash	Cash	Total			Export	Home	Non-Cash	Cash	Total			Export	Home
Sugar	....	299·2	299·2	0·1	299·3	286·0	13·3	....	6·2	6·2	·1	6·3	5·9	·4
Coconut Products	5·0	40·0	45·0	....	45·0	40·0	5·0	·3	1·8	2·1	....	2·1	1·8	·3
								·3	8·0	8·3	·1	8·4	7·7	·7
Root Crops—														
Dalo	36·0	5·0	41·0	....	41·0	1·0	40·0	1·3						
Tapioka	60·0	....	60·0	....	60·0	....	60·0	1·2	·2	3·7	·1	3·8	....	3·8
Others	26·0	....	26·0	4·0	30·0	....	30·0	1·0						
Rice	9·8	3·5	13·3	4·7	18·0	....	18·0	1·0	·3	1·3	·3	1·6	....	1·6
Vegetables (including Dhal)	16·7	4·0	20·7	4·3	25·0	....	25·0	·9	·3	1·2	·3	1·5	....	1·5
Fruit	7·2	2·0	9·2	0·8	10·0	....	10·0	·1	....	·1	·2	·3	....	·3
Bananas	4·8	6·5	11·3	....	11·3	6·3	5·0	·2	·3	·5	....	·5	·3	·2
Meat (boneless)	....	....	....	....	....	....	....	·1	·3	·4	·4	·8	....	·8
Beef	0·3	1·4	1·7	0·4	2·1	....	2·1	....	....	....	....	....	....	....
Other	0·2	0·3	0·5	1·0	1·5	....	1·5	....	....	....	....	....	....	....
Dairy Products and Margarine (milk equivalent)	16·0	14·0	30·0	20·0	50·0	....	50·0	·8	·7	1·5	·5	2·0	....	2·0
Cooking Oil, Dripping	·4	·1	·5	1·8	2·3	....	2·3	....	....	....	·3	·3	....	·3
Eggs (million doz.)	0·7	0·8	1·5	negl.	1·5	....	1·5	·2	·2	·4	....	·4	....	·4
Yaqona	0·4	0·4	0·8	....	0·8	....	0·8	·1	·1	·2	....	·2	....	·2
Tobacco	....	0·2	0·2	0·2	0·4	....	0·4	....	·2	·2	·1	·3	....	·3
Flour	....	....	....	10·5	10·5	....	10·5	....	....	....	·4	·4	....	·4
Sharps	....	....	....	17·4	17·4	....	17·4	....	....	....	·8	·8	....	·8
Fish	4·4	2·0	6·4	2·1	8·5	....	8·5	·7	·2	·9	·3	1·2	....	1·2
Shellfish	6·0	1·0	7·0	....	7·0	....	7·0	·2	....	·2	....	·2	....	·2
Others	....	....	....	....	....	....	....	....	·1	·1	·6	·7	·7	....
								8·1	10·9	19·0	4·4	23·4	8·7	14·7

Agriculture

234. Agriculture can be a highly productive and fast growing sector of the economy. Examples are Mexico, Japan, Europe and the United States of America. Agricultural production in Japan has been growing at a rate of 4·6 per cent. per year, although the natural conditions are very poor for this industry. In Mexico the increase has been as much as 7·1 per cent. annually based on scientific planning. Western Europe has been doing exceedingly well in agricultural production, with a population density much greater than Asia's and with a poor endowment of farm land generally. Italy, Austria and Greece, with less arable land *per capita* than India and with farm land inferior to India's, have increased agricultural production at rates of 3·0, 3·3 and 5·7 per cent. respectively. In the United States, in spite of all kinds of restrictions on output, farm production rose by 56 per cent. between 1940 and 1961, while cropland declined by about 10 per cent. and farm labour by about 40 per cent.; thus the productivity of labour rose nearly three times as fast in Agriculture as in Manufacturing.

235. Traditional Agriculture can be transformed into a highly productive industry. This transformation is not principally dependent on the quality of the land or on the size of land holdings. To achieve it, there must be investment, and the main question is how to invest in Agriculture. The proposition may be made that in raising the productivity of Agriculture, differences in the quality of material capital are of substantial importance, and differences in the training and acquired capabilities of farm people are most important.

236. Thus investment in Agriculture should be directed toward technological research and extension services. It should also cover agricultural infrastructure such as contouring, drainage and irrigation, roads, and loan and marketing facilities. However, capital investment in Agriculture which is not accompanied by improved technology and the training of people is not likely to achieve much.

237. Fiji, like most developing countries, is predominantly agricultural, the Sector Agriculture accounting for about 45 per cent. of gross domestic production. No complete Census of Agricultural Production has ever been taken. Broad estimates have, therefore, been made of supply and demand in the year 1963. The results are shown in Table 19. Domestic production is divided into non-cash and cash production;. this division is, of course, significant but hazardous. Total exports of agricultural primary and processed products amounted to about £F15 million in 1965, while total imports of food items for home consumption were about £F6 million. Thus Fiji has a heavy deficit in its domestic food balance.

238. In view of the relative and growing scarcity of arable land, and having regard to the increasing pressure of population, it must be the aim of agricultural policy to husband the natural resource base and make the best possible use of it. This means that all arable land should be reserved for agricultural purposes, and that yields should be progressively raised.

239. A comprehensive Land Use Survey will determine which areas are to be allocated to Agriculture, and within that total there must be a rational subdivision for the different crops according to ecology and climatic conditions. It cannot be said that land is at present always used according to its best inherent potential.

AGRICULTURAL PROJECTIONS 1970

240. An attempt may be made to set realistic targets for agricultural production in 1970. Such projections must reflect the future home demand for food as well as the export potential.

241. Projections for domestic food demand must be consistent with proper nutritional standards, and they must also reflect the food preferences of the different population groups in Fiji. In order to satisfy these requirements, the demand has been estimated for eleven distinct population groups based on appropriate nutrition scales for each of them. The home food demand for 1970 so estimated may be supplied either from home production or from imports. It will be the aim of agricultural policy to produce in Fiji as much as possible of the home demand, provided it can be done efficiently. The objective will be to reduce imports to a mininum. Some imports are, of course, inevitable, such as those of wheat flour and temperate fruits.

242. Export targets for agricultural production are set with reference either to available markets or to the level of domestic production which can be achieved. Sugar is a case in point where the market will be the limiting factor, whereas actual production will set the ceiling for coconut products and bananas.

243. The following table is intended to quantify the level of agricultural production in 1970. It must be understood that the value figures relate to the output of the Sector Agriculture only, i.e. they do not include the values added by further processing (for instance sugar or copra milling), transport, commercial services, etc.

SECTOR AGRICULTURE — TABLE 20

PROJECTED DEMAND AND PRODUCTION 1970

	Quantity tons 000		*Value £F million factor cost*	
	Demand	*Production*	*Demand*	*Production*
Export Demand—				
Sugar	400	400	7·1	7·1
Coconut Products (copra equivalent)	50	50	2·5	2·5
Bananas	13	13	0·6	0·6
Cocoa	0·3	0·3	0·05	0·05
Passion Fruit	1·2	1·2	0·05	0·05
			10·3	10·3

Home Demand—

Root crops	154	154	4·1	4·1
Rice	25	17	2·0	1·4
Vegetables	30	28	1·6	1·4
Fruit	13	12	0·5	0·4
Bananas	6	6	0·2	0·2
Beef boneless	2·8	2·2	0·6	0·5
Other Meat boneless ..	2·0	0·6	0·5	0·2
Dairy Products and Margarine (milk equivalent)..	65	35	2·6	1·8
Sharps	22	....	0·9	....
Flour	15	....	0·6	....
Fish	10	7·5	1·5	1·0
Shell fish	9	9	0·4	0·4
Sugar	16	16	0·4	0·4
Dhal	3	....	0·2	....
Oil, Dripping	3	1	0·6	0·2
Fresh coconuts (as copra) .	5	5	0·3	0·3
Eggs (dozen)	2 m.	2 m.	0·4	0·4
Yaqona	1	1	0·3	0·3
Tobacco leaf	0·5	0·3	0·4	0·1
Others			2·4	2·4
			20·5	15·5
Grand Total ..			30·8	25·8

244. No doubt it would be useful if the estimates of production for home food items were to be exceeded. But it appears on the face of it as if there will still be a considerable food import deficit in 1970.

EXPORT CROPS

245. *Sugar*—The growing of sugar-cane and the raw sugar produced from it are the outstanding activity in Agriculture. The industry is efficiently administered by the South Pacific Sugar Mills Limited. Exports of sugar are expected to reach a level of 400,000 tons by 1970, to which a further 16,000 tons is added for local consumption.

246. *Coconut Products*—Copra was the subject of a survey report by Lord Silsoe in 1963 which postulated an increase in copra production from 40,000 tons to 80,000 tons over a period of 17 years. The export value of coconut products is expected to rise to £F4·6 million. The extra output is to be derived as to 20,000 tons from the clearing and thinning of existing coconut plantations, 3,500 tons from extensions of existing plantations and 17,500 tons from new planting. The present coconut acreage is about 190,000 acres.

247. The Silsoe coconut policy provides for substantial subsidisation which has been running at a level of over £F200,000 a year; it will taper off during the period 1969–1974 when annual maintenance subsidies only will be given at a level of £F100,000 a year plus administrative expenses of about £F25,000 a year.

248. The Coconut Industry Board now is responsible for the industry and has introduced a copra grading schedule with price differentials, which should promote better quality and thereby enhance the value of production.

249. There remains the problem that over 50 per cent. of the existing palms are over 50 years old.

250. Note should be taken of new processes in the utilisation of coconuts which are said to be in an advanced stage of research and development. It seems to be the object of these processes to use fresh nuts yielding an oil of superior quality. There may be also valuable by-products such as coconut flour, and syrup from the milk which is now usually wasted. If a new technology for the conversion of coconuts is established, the traditional methods of copra harvesting, drying and processing into oil will become obsolete. The effect of such changes on the copra industry, and possibly on transport, might be considerable.

251. *Bananas*—About 6,000 tons of bananas are exported annually, valued about £F300,000. The main export market is New Zealand; but attempts are being made to enter the Japanese market, although so far unsuccessfully. Bananas have traditionally been grown under shifting bush cultivation, mainly on the terraces of the principal rivers in the wet zone of Viti Levu. Production was recently extended to Class II land in the foothills of South-East Viti Levu, which are conveniently situated for delivery to the export point Suva. Because of the need to ship bananas after cutting with the least delay and damage, it is Government policy to encourage production only within a radius of 35 miles from Suva.

252. Plantation scale production has been introduced during 1962–1965 in the Lomaivuna Scheme in South-East Viti Levu, managed by the Fiji Development Co. Ltd. (a subsidiary of the Colonial Development Corporation). Two hundred farmers are settled on the Scheme, having 10 acres each and of which 4 acres are planted to bananas. The total scheme will cost £F350,000 in capital outlay, of which some £F135,000 has been provided from C.D. & W. grants for roads and central services, and £F215,000 by way of loans at an interest rate of 6½ per cent. repayable over 15 years. A delay has occurred in repayments due to the hurricane and the later dry spell in 1965 which seriously affected production. Production will be approximately 6,600 tons of bananas at a gross sales value of about £F300,000 per annum. An average farmer is expected to derive a cash income, after meeting all charges, of about £F250 per annum; thus the total net income from bananas should be in the region of £F50,000 per annum.

253. Yields in banana plantations are considerably higher than in village cultivation. It is hoped, therefore, to expand banana growing by farmers organised in plantation schemes. Present plans are for:—

	Acres	*Tons*
Exports—		
Lomaivuna	800	6,600
Co-operative Groups	800	4,100
Traditional Growers	1,400	3,300
	3,000	14,000
Home Consumption	2,600	6,000
Total ..	5,600	20,000

254. *Cocoa*—The acreage of cocoa established by the end of 1965 is estimated at 3,000 acres, and it is hoped that there will be 8,000 acres planted by 1970. Actual production in 1970 is likely to be about 300 tons of dry beans at a value of about £F50,000. Thus it seems that cocoa will remain a minor crop.

255. The introduction of cocoa is being actively pursued, although yields and economics have not yet been fully assessed. The real costs of production are obscured by a range of inducement and fertilizer subsidies, as well as sliding price subsidies giving the grower a fixed selling price.

256. Cocoa is grown under thinned forest or planted leguminous tree shade. Intercropping under coconuts can also be done. Well drained soils of reasonably good fertility with a continuously humid climate are needed. These conditions obtain in the wet zones of Viti Levu and Vanua Levu and also on Taveuni and elsewhere.

257. *Other Products*—There is hope that the export of canned products will make headway. At the present time the only canned product exported from Fiji in any significant quantities is passion fruit juice. Pineapple fruit and juice was formerly exported but the industry did not survive. Possibilities include fruit salad, pineapples, guavas, citrus fruit, melon, pap paw, tomatoes and mushrooms. Close integration of production, processing and marketing are essential.

258. Little factual information exists on the prospects of plantation tree crops. More research will be useful as regards oil palm, cocoa, coffee and tea in the wet zones. The Fiji Development Company has been conducting trials into the potential for oil palm. Sisal, Mauritius hemp and cashew nuts are possible products in the dry zones.

PRODUCTS FOR HOME CONSUMPTION

259. *Beef and Dairying*—There are import deficits in meat and milk products. Some of these are inevitable because the demand is partly for canned food. There is also the problem of competition from the import of dairy products benefiting from export subsidies in the country of origin.

260. In planning beef production, the starting point is an estimate of the size and structure of present herds. Ten thousand two hundred and ninety-eight beasts were slaughtered in 1963 in slaughter houses at an average weight of 462·5 lbs., to which must be added the weight of beasts slaughtered elsewhere; the estimate of total domestic beef production for that year is 1,700 tons of boneless meat. There is some pattern of rates of breeding, slaughtering, growth of herds and required pastures. The enlargement of herds of cattle is limited by the biological fact that in general no more than one calf per animal per year is possible. As a result there is a very definite time lag in the fruition of any animal breeding programme. The following is a preliminary estimate of projections up to 1980:—

	1970 *Tons*	1975 *Tons*	1980 *Tons*
Beef production (boneless)	2,163	3,075	4,088
Total acreages needed (beef and dairying)	268,275	352,600	429,800
Domestic consumption of beef	2,800	3,300	3,800

This does not allow for the possible importation of beasts to increase the herds more quickly. Another aspect is that, if growth of production according to the above projections is envisaged, canning will have to be introduced at some stage. Stock production would be profitable in conjunction with copra on about 80,000 acres held in individual ownership.

261. In dairying, it is aimed at increasing production per cow and per acre of pasture rather than at increasing stock numbers or the total area devoted to dairying. The industry should be able to satisfy demand from improvements in yields.

262. *Rice*—Rice production is unsatisfactory because it is inefficient and mainly part of the subsistence economy. Under the existing system, production for cash sale is not very remunerative, although there is a customs protection of £F15 per ton on polished rice. There is a considerable import deficit; the total domestic demand in 1963 was estimated at 18,000 tons of polished rice, of which 4,700 tons were imported. In money terms, the import deficit was £F300,000; and it is likely to grow to £F600,000 by 1970 unless some drastic action is taken. Rice growing is intimately bound up with drainage and irrigation schemes in the Nausori and Navua areas of South-East Viti Levu. It is possible that the large-scale change over to wet rice from dry rice might provide part of the solution to this problem.

LAND SETTLEMENT AND DEVELOPMENT

263. Land settlement and development has represented a major Government initiative in recent years. The objectives are to establish systems of diversified farming, make efficient use of the land, raise productivity and settle rural families.

264. Legislative Council makes available each year a block vote for grants and loans. Individual development schemes are submitted by the Regional Development Boards to the Land Development Authority in respect of financial grants and to the Agricultural and Industrial Loans Board in respect of loans. Selection of areas in which to demarcate holdings is made by the Regional Development Boards, and the demarcation of individual holdings is done by the Soil Control Section of the Agriculture Department. The actual farming plans are drawn up on the spot by the staff of Agriculture Department.

265. It is the present intention to settle each year about 800–1,000 farmers and their families, and a list of schemes has been compiled for implementation during the period 1966–1970. Naturally this list is bound to be revised as schemes are investigated in closer detail. There are schemes for cattle, cocoa, coconuts, rice, and mixed farming. However, it is likely that the actual number of families settled will fall short of the above figure.

266. According to the manpower projections, the labour force employed in Agriculture will rise from about 69,000 in 1965 to about 82,000 in 1970. This represents about 1,200 new agricultural households to be found employment in Agriculture per year. Thus the target figure for settling families represents a substantial proportion of the total annual increase in such families. However, not all the new settlers are new-comers to Agriculture, as a certain proportion are re-settled families moved from their traditional homes to new areas in order to provide a more suitable environment.

267. Settlement schemes form a relatively small part of the total agricultural pattern. In 1965, the actual new acreages established under development projects amounted to 4,000, mainly sugar, bananas and coconuts. This represents approximately an addition of one per cent. of the total acreage cropped, excluding pastures.

268. The average cost (excluding loans) of a holding is £F150, representing the apportioned charges of management of £F100 for five years and of buildings £F50. In addition, the average road costs per holding are £F200. Thus the development cost per average farm is £F350. The direct expenditure of the land settlement programme for the period 1966–1970 is, therefore, in the region of £F1·3-£F1·5 million. There are also loan requirements for crops, other than tree crops, amounting on average to £F400 per holding.

269. The total annual cost of land settlement and development is at present about £F800,000, of which about two-thirds is met from Colonial Development and Welfare Funds. It includes about £F300,000 for subsidies of coconut and cocoa schemes, and about £F200,000 in grants and loans. It also includes an expenditure of about £F120,000 on development roads.

270. The present approach to land development is of basic significance, and it would be well to reappraise it from time to time. The techniques of Community Development, as an alternative for instance, might well be capable of giving a stimulus to the organic growth and improvement of rural life and agricultural production.

271. Settlement schemes are intended to be viable. However, the definition of viability is difficult in this matter. It is not sufficient, in cases of loan financing, to assure repayment of the loans. In order to judge the economic merits of a scheme it is also necessary to relate the settler's labour and other inputs to his net income after meeting all charges. In cases where the real net income per hour worked is low, it is doubtful whether the scheme can be considered as viable, and it cannot be expected that it will be stable or that it will endure. It is suggested, therefore, that schemes should be subject to a cost-benefit analysis before being authorised. Scheme memoranda must also be thoroughly scrutinised to make sure that the expected costs and yields are realistic.

RESEARCH

272. It is of fundamental importance to support the agricultural development programme with an adequate and well-balanced research programme. Technical know-how is an indispensable ingredient in promoting the improvement and extension of Agriculture. As was mentioned earlier on, the main contribution to an increase in agricultural production must come from better yields. While the extension services are the vehicle by which knowledge is disseminated, it is the research activities which must produce the knowledge itself of cultural methods which is to be disseminated. It has been shown by experience that techniques and research results cannot be directly transferred from one country to another because the natural conditions are never alike in two places.

273. The Agricultural Department has two main Research Centres, employing qualified research staff. These are Koronivia in the wet zone, and Sigatoka in the intermediate zone. Research facilities in the dry zone are inadequate, partly because of the dominant position of sugar in respect of which research is adequately provided by the South Pacific Sugar Mills Limited. Thus a new Research Centre should be set up in the dry zone. Crops requiring urgent investigation in the dry zone are rice, ground nuts, pulses, and grains; the Centre should also assume responsibility for trials in its area on, for instance, coffee and potatoes.

EXPENDITURE

274. The annual expenditure on Agriculture and Land Development amounts to about £F1·5 million. The following table gives an approximate breakdown for 1966.

ANNUAL AGRICULTURAL EXPENDITURE — TABLE 21

	Agriculture	*Land Settlement*	*Total*
	£F thousand		
Recurrent Expenditure	520	150	670
Capital Expenditure	60	190	250
Subsidies	70	280	350
Grants	....	100	100
Loans	....	100	100
	650	820	1,470

275. Of this total expenditure about 40 per cent. is covered from the Colonial Development and Welfare Fund. Analysis shows that its breakdown by broad purposes is as under:

ANALYSIS OF AGRICULTURAL EXPENDITURE — TABLE 22

	Per cent.
Administration	5
Research	7
Extension and Training	22
Development	66
	100

Forestry

276. The objective is to increase the available timber resources of the Colony with both Hardwoods and Softwoods. This requires more emphasis to be placed on research, management, administration, training, etc., which is essential for large scale operations to be soundly based and to proceed smoothly.

277. Planning for the proper utilisation of the Colony's forest resources depends on determining the actual growing stock present in the forests. There has been considerable expansion in sawmilling in recent years and this trend has been encouraged by Government. However, the dangers attached to expanding an industry without an adequate knowledge of the raw material resources available are considerable and obvious. But this is being done, in fact, with the timber industry in Fiji. In addition to assessing the timber resources for rational exploitation, detailed knowledge of the forest areas would be of immense value in drawing up working plans for the Hardwood Planting Schemes. A picture of the position and extent of timber resources and of suitable land for re-afforestation is basic to the proper development of the forest industry. Such information can only be provided by a specialised Management Division and provision for setting up such a Division should be made.

278. In view of the foregoing it is proposed that, until the total timber stocking of the forests has been assessed, all forest areas in the Colony should be temporarily frozen to new large-scale timber concessions. Owing to the need of specialist training for the staff, it will not be possible to commence properly on the field work of assessing forest resources until late 1966 or early 1967. Thus, the duration of the closure of natural forest areas to new timber concessionnaries would be for about 5 years, after which time a re-appraisal of the licensing policy would be made using the data obtained from the proposed Management Division's enumerations.

279. It is recommended that the present procedure of *ad hoc* licensing should cease, and that licencees be directed into areas considered unsuitable for inclusion in the permanent forest estate or into land due for clearing under approved land development schemes. Considerable economies can be made by concentrating licensing in consolidated blocks.

AFFORESTATION

280. Following the investigation in 1959 of the timber resources of the Colony, it was estimated that future requirements would need a productive forest estate of 350,000 acres of indigenous forest, or a minimum of 100,000 acres should the estate consist of artificially established plantations. The plantation system was accepted and from 1960 onwards considerably more attention has been paid to afforestation and reafforestation. The planting programme was increased from the original 500 to 600 acres per annum to a minimum of 2,500 acres per annum, and further expansion is planned over the 5-year period 1966–1970.

281. The present policy is for 65 per cent. of this annual programme to be established in the lowland rain forest zone and 35 per cent. in the Northern and North-Westerly parts of the Colony.

282. The present consumption of timber in the Colony is 7 cubic feet per annum *per capita*. With improving standards of living, this figure is expected to rise to 14 cu. ft. by 1995. In addition, the existing population of Fiji is projected to increase from 450,000 to about 1·1 million during the same period. The present consumption of timber per year is 3·2 million cu. ft. round, and using the figures stated, consumption by 1995 will be 14·1 million cu. ft. It is further calculated that, ignoring imports and exports, the indigenous forest will be cut out by 1995.

283. Future supplies will be safeguarded by the establishment of plantations of fast growing species of Hardwoods and Softwoods which will mature at the time when supplies of native species are being worked out. Most of the plantations will consist of *Swietenia macrophylla* (Mahogany), and *Pinus caribaea* with smaller proportions of *Pinus elliottii*, *Endospermum macrophyllum* (Kauvula), Eucalyptus and other species. The emphasis is placed on timber production. Firewood and pole production do not require any special attention in the coming Development Plan.

HARDWOOD PLANTATION PROGRAMME

284. The largest part of the Hardwood Programme 1966–1970 will be concentrated in Southern Division, with smaller proportions in the Northern and Western Divisions. The main Hardwood species will continue to be Mahogany, with at least 20 per cent. of the annual planting programme comprising other species by 1970.

285. The proposed annual programme and its distribution is as follows:—

TABLE 23

HARDWOOD PLANTING PROGRAMME

Division	Area	Acreage 1966	1967	1968	1969	1970	Total
Southern	Tailevu	1,000	1,000	1,000	1,000	1,000	5,000
Southern	Naboutini	500	500	500	500	500	2,500
Southern	Galoa	500	500	500	500	500	2,500
Northern	.....	....	250	250	500	500	1,500
Western*	Ba/Varaciva	25	25	25	25	25	125
	Total	2,025	2,275	2,275	2,525	2,525	11,625

* Eucalyptus

286. Most of the timber will be utilised within the Colony and any surplus will be disposed of in the export market.

SOFTWOOD PLANTATION PROGRAMME

287. The Softwood Programme will be concentrated in Western and Northern Divisions. Pending investigations of the timber quality, plantations will be limited to an annual programme of 1,500 acres, the main species being *Pinus caribaea*.

TABLE 24

SOFTWOOD PLANTING PROGRAMME

Division	Area	Acreage 1966	1967	1968	1969	1970	Total
Western	Ba/Varaciva	400	400	600	850	850	3,100
Western	Koro No. 1	350	350	350	100	100	1,250
Western	N/Highlands	50	50	50	50	50	250
Northern	Seaqaqa	2.0	500	500	500	500	2,250
	Total	1,050	1,300	1,500	1,500	1,500	6,850

TOTAL PROGRAMME

288. The total proposed planting programme, Hardwood and Softwood, is as follows:—

TABLE 25

TOTAL PLANTING PROGRAMME

Item	*Acreage* 1966	1967	1968	1969	1970	*Total*
Softwood . ..	1,050	1,300	1,500	1,500	1,500	6,850
Hardwood ..	2,025	2,275	2,275	2,525	2,525	11,625
Total ..	3,075	3,575	3,775	4,025	4,025	18,475

FOREST MANAGEMENT

289. Provision must be made for a Management Unit to assess the entire timber resources of the Colony and to draw up working plans for the Hardwood and Softwood planting schemes throughout the Colony. Work of this nature can only be done by a team of outside specialists assisted by local staff.

290. In the first year of the Plan, efforts will be concentrated on recruiting and training local staff, two assistants being attached to the Lands and Mines Department, Suva, for training in the Aerial Photographic Section of that Department. Field work would commence in late 1966 or early 1967.

RESEARCH

291. Research investigations for the period of the Plan will cover the following aspects:—

(i) investigation of difficulties which are impeding or are likely to impede the progress of silvicultural schemes throughout the Colony;

(ii) investigation of methods of improving the present utilisation of the Colony's timber resources;

(iii) keeping under review all the technical activities of the Department and, within the limit of the Division's resources, undertake research into new problems which arise;

(iv) collection, recording and dissemination of information on all aspects of Forestry concerning Fiji.

292. Silvicultural investigations will cover the assessment of trial plots, the introduction of new species, the establishment of seed orchards, cheaper methods of raising seedlings, the tending of Pine and Mahogany plantations, and the determination of growth rates.

293. Timber utilisation investigations will be considerably expanded with priority being afforded to—

(i) the practical testing of local timbers;

(ii) the assessment of the sawmilling and logging industry;

(iii) the economic and technical survey for the utilisation of forest produce in connection with establishing a fibre-particle board industry;

(iv) the utilisation of Pine and Mahogany;

(v) the continuation of investigations into seasoning, timber preservation, log degrade, and other aspects of timber utilisation under local conditions.

RECRUITMENT AND TRAINING

294. Three levels of recruitment are proposed, i.e. Forest Guard/Forester, Forest Ranger, and Assistant Conservator of Forests.

(i) *Forest Guard/Forester*—Such recruits may be obtained from any age group and will be required to work as labourers for a minimum period of 6 months to assess their Forest Guard potential. Suitable recruits will then attend the Forestry Training School for a short course in the basic principles of tropical forestry. At its conclusion the trainee will be promoted to the rank of Assistant Forest Guard for a probationary period of 6 months, followed by appointment to Forest Guard. Further promotion to Forester will be by ability.

(ii) *Forest Rangers*—Forest Rangers may be obtained either by promotion of suitable in-service material from the Forest Guard/Forester ranks or by recruitment. Recruits from outside the Department will spend a minimum of 2 years as a Forest Guard before being sent overseas for a Diploma or equivalent Certificate.

(iii) *Assistant Conservators of Forests*—Assistant Conservators of Forests are graduates, and suitable recruits must rely mainly on Government Scholarships to enable them to take a degree at an overseas University. Cadets for scholarships will be required to work in the Department as labourers during the vacations when studying in the post University Entrance class.

295. In addition to the course for new recruits, short courses of both a general and particular nature will be held. All training courses will be supervised by an officer of Forest Ranger " A " rank. He will be assisted by other Senior Officers who will give lectures and practical training on aspects in which they have special knowledge.

FOREST AMENITIES

296. It is proposed to develop amenities:—

(*a*) *Ornamental Planting*—Ornamental trees and shrubs are available free of charge on Arbor Day and this policy will continue. Every effort will be made to introduce new species to the range of ornamentals already established in the Colony.

(*b*) *Botanical Gardens*—Over the period of the Plan it is proposed to develop 150 acres in the Kalabo area of Colo-i-Suva. The basis of a Garden is already present from existing trial plots and this will be improved by the addition of further species to constitute an Arboretum, with suitable lawns and improved access.

(*c*) *Colo-i-Suva Forest Park*—It is proposed to develop this area by opening up a number of natural beauty spots and to provide paths, trails, camping and picnic sites. It may be regarded as the first of a series of Forest Parks and is in the nature of a pilot project, future development being dependent on the progress made there.

(*d*) *Nature Reserves*—As the majority of forests are native owned, large Nature Reserves are not practical in view of the need to compensate the owners for loss of revenue from the timber resources. However, it is desirable to retain small patches of up to 100 acres of indigenous forest for posterity.

The tentative programme includes investigation of areas at Koroutari, Buca Bay, Namau, Tubenasolo, Nausori Highlands, Galoa and Naboutini.

SUPPLEMENTARY SOFTWOOD SCHEME

297. The planting programme proposed in this Plan compares favourably with programmes of many countries overseas whose Forestry Departments possess a far larger staff of professionally trained officers. Nevertheless, with the anticipated timber shortage in the world, there are very good reasons why Fiji should take advantage of this by increasing its projected programme. The question is whether this expansion should begin during the period of Development Plan 1966–1970 or whether it would be advisable to wait until better preparation has been made. Some reasons for postponing major expansion for a few more years are as follows:—

(i) Increased planting will have to be mainly in Softwoods (*P. caribaea*). Seed shortage precludes an immediate increase in Mahogany, as local supplies are insufficient and overseas sources are both limited and unreliable. *P. caribaea* timber has not been thoroughly tested for sawn timber purposes, and there are some reservations about its quality because of its rapid growth rate here.

(ii) Local factors such as leasing adequate land does not give rise to confidence for an early expansion. Difficulties in obtaining sufficient land for existing schemes are still being encountered.

(iii) Attainment of a target of over 4,000 acres by 1970 will tax the resources of the Department severely. This is particularly true of trained staff and, as there is no large reserve of local staff with experience in Pine planting, expansion will have to depend largely on inexperienced officers for its implementation. One has to recall that *P. caribaea* has only been accepted as a major afforestation species in the last few years. The programme with this species as recently as 1963 was 140 acres.

298. If, despite the above considerations, an expansion is called for, provisional Estimates for an additional 3,000 acres per annum of *P. caribaea* by 1970 (bringing the total annual Departmental planting programme to 7,000 acres) will be needed of the order of £F450,000 over 5 years.

Manufacturing

299. Manufacturing is essentially an activity for private enterprise. There would be little point in setting paper targets for the production of different goods. It is true, of course, that the general economic projections for the Plan period must include global estimates of the likely development of the Manufacturing Sector.

300. Government can help the expansion of the Manufacturing Sector by suitable supporting measures and the creation of institutions. This is not the place for reviewing the various incentives which Governments have found useful in stimulating industrial enterprises. However, it may be suggested that the establishment of a Development Bank or Development Corporation could do much for the promotion of Manufacturing in Fiji.

301. Development Banks are a relatively new kind of investment institution. Unlike ordinary banking institutions, they not only make advances but also mobilise savings, enterprise and skills for productive investment in the private Sector. In developing countries there are usually missing ingredients, such as the absence of a capital market, commercial knowledge or technical expertise, which a Development Bank can help to overcome.

302. A Development Bank is concerned, like any other bank, with the financial results of investment and their consequences in terms of profit and loss. But at the same time a Development Bank is concerned with the general impact of a project on the economy as a whole. This combination of banking and development criteria in investment decisions determines the distinctive character of a Development Bank.

303. Technical assistance has proved a valuable aid to the establishment of industries. Many projects, particularly those sponsored by smaller companies, need a great deal of work before they can be considered for financing. A Development Bank would be designed to give this specialised kind of assistance.

304. Research and surveys of business opportunities should be included as a function in a Development Bank's activities. The Bank may systematically try to interest private investors in particular investment opportunities. Often the very fact that the Development Bank has shown interest in a particular field has proved sufficient to produce a response from private enterprise. Regular Information Bulletins issued by the Development Bank will also act as a stimulus.

305. A Development Bank may be set up as a public corporation, obtaining its funds both from the Government and from private financial sources on commercial terms. The World Bank has found that a Development Bank offers a practical solution to its difficulty in financing relatively small private industrial projects; it has used the Bank in a country as a convenient means for channeling capital into private industry without having to undertake itself the necessary technical and financial appraisals.

306. A Development Bank would promote industrial projects by providing either finance to a private company or by joining a mixed company. In the last resort, the Bank could set up an enterprise entirely on its own, if it thought a project essential but could not find private investors interested in it. In such cases the ultimate objective would be for the Development Bank eventually to sell the enterprise as a going concern to a private company. Thus the Development Bank would make available both loan capital and equity capital.

307. The work of appraising projects and managing financial operations of a Development Bank requires the services of various specialists, such as accountants, economists, financial analysts, etc. Some of this technical staff might be made available on a consultancy basis by other bodies or Departments. It may also be mentioned that International Organisations have provided the services of technical experts from time to time.

Tourism

308. Fiji had in 1964, 17,459 visitors and 14,165 transit passengers, i.e. the total number of people visiting the Colony was 31,624. In addition, there were about 110,000 through passengers. The number of visitors and transit passengers has increased since 1952 by about 500 per cent., and the increase during the last two years was 33 per cent. and 30 per cent. respectively.

309. According to an analysis made for 1963, visitors stayed on average 7·8 days and transit passengers 2·2 days. The overall average stay was 5·5 days. Details can be found in the Annual Report for the year 1963 of the Fiji Visitors Bureau. It may be estimated that total expenditure by tourists in the Colony amounts at present to about £F4 million of which about £F3 million is in respect of imported goods bought directly or indirectly by tourists. This means that only about 25 per cent. of tourist expenditure remains in Fiji; the so-called leakage is therefore very high.

310. Taking the hotel business by itself the position as regards tourist expenditure retained in the Colony is more favourable; in 1965 out of an estimated total tourist expenditure of £F1·7 million, £F0·7 million was retained in Fiji.

TABLE 26

ESTIMATED COMPOSITION OF HOTEL EXPENDITURE, 1965

	£F million
Hotel profits and wages	0·6
Local purchases of goods and services	0·1
Imports of goods and services	1·0
	1·7

TABLE 27

ESTIMATE OF PURCHASES OF DUTY FREE GOODS, 1965

	£F million
Import value of goods	1·8
Port charges, profits, wages	0·3
	2·1

TABLE 28

ESTIMATE OF LOCAL TRAVEL EXPENDITURE, 1965

	£F million
Domestic income	0·2
Imports of fuel, spares, etc.	0·1
	0·3

311. One may estimate hotel receipts from tourists for 1965 as follows, based on statistical returns made to the Commerce and Industries Office. The data relate to the 14 important tourist hotels in Fiji. Receipts from meals and accommodation were about £F0·75 million and receipts from bar and liquor sales about £F0·3 million.

312. The average occupancy rate for beds is about 50 per cent. and for rooms 75 per cent.

313. Employees in hotels number 700–800.

314. An American firm of business consultants, Harris, Kerr, Foster & Company, made a report on the Travel and Tourist Industry in Fiji at the request of the Government (Council Paper 32 of 1965). They list about 25 hotels in the entire Colony having tourist accommodation. These hotels had a total of approximately 675 rooms and about 1,200 beds. According to this Report, the hotel facilities, and more particularly the guest room facilities, are inadequate in number and in standards to provide for the influx of tourists which can be expected in the immediate future. The consultants also found that the training and supervision of hotel employees was inadequate.

315. Harris, Kerr, Foster & Company have forecast that the number of tourists visiting Fiji will increase at an average annual rate of 18 per cent. between now and 1970, and that the total number will grow from about 40,000 now to 85,000 in 1970. They also expect that the number of visitors will increase by a further 90 to 100 per cent. between 1970 and 1975, so that the number of visitors in 1975 would be around 160,000. The consequent additions to hotel guest rooms required between 1965 and 1970 would be of the order of 800. This is based on the following assumptions:

(1) Eighty per cent. of visitors will stay in hotels,
(2) Average length of stay will be 8·6 days,
(3) The annual average room occupancy will be 75 per cent. of rooms available,
(4) Seventy per cent. of rooms will have double occupancy.

316. Accepting these forecasts, 160 additional guest rooms will be required in each of the years up to 1970. At an assumed average capital cost for a twin room of £F6,000, this will represent a capital expenditure approximating £F1 million a year.

317. In Fiji, as in a number of Pacific territories, there has been some uncertainty about the desirability of fostering Tourism. Such uncertainty has been caused by some prejudice against the Tourist Industry and the feeling that Tourism would lead to an undesirable influence on the life of local people. It may be observed that prejudice against Tourism which has existed in other developing countries is fast disappearing. The fact should be accepted that Tourism is a modern large-scale industry representing a substantial source of employment and income in many developed and under-developed countries.

318. It will be necessary to prepare a long-term plan for Tourism. It should be drawn up by Government in consultation with the Fiji Visitors Bureau. A substantive programme for Tourism in Fiji should include—

(*a*) the designation of Tourist areas,
(*b*) recommendations on types of hotel for different categories of tourists,
(*c*) the creation of services and tourist amenities.

319. Tourism should have one or more focal points. The concentration of tourist facilities will have a cumulative and stimulating effect on development. The dispersal of hotels will not make the same impact, nor will it allow a full range of tourist attractions to be provided. The creation of a wider range of attractions and services can only come about if there are enough tourists in a given limited area to make it commercially worthwhile.

320. It will be desirable to designate a suitable locality as a holiday development area to be developed by Government or by a statutory body or licensed private corporation. The object would be to obtain options on the land, create common facilities such as roads, beaches, promenades, buildings, services, facilities for activities (yachting, golf course, horse riding, tennis courts, lido, shopping, entertainment, etc.), and to make available plots to prospective hotel enterprises.

321. Government will be required in many ways to assist and promote the Tourist Industry. The Hotels Aid Ordinance is one way of supporting the establishment of new hotels, there may be other ways and it will be necessary to see how help may be given. The tourist consultants' report, mentioned earlier on, contends that the funds available to the Fiji Visitors Bureau are inadequate. It proposes an increase both in the Government grant and in the amount to be raised from commerce and industry.

Transport

322. It must be a major objective to evolve a long-term transport policy forming an integral part of general development policy. The obvious transport requirements of the country have so far been met by individual projects. The point has now been reached when a large-scale survey is required covering both the economic and technical aspects of transport. The results of such a survey will have an important bearing on the direction of future investment in transport facilities.

323. The " Commission of Enquiry into the Natural Resources and Population Trends of the Colony of Fiji 1959 " reported on communications as follows (Fiji Council Paper I of 1960, page 105). Their findings still apply.

> " As regards its external communications Fiji is well served by vessels and aircraft. Passenger and cargo ships of several steamship lines call regularly at Suva, while sugar is loaded by vessels chartered by the Colonial Sugar Refining Co. Ltd. (since then known as the South Pacific Sugar Mills Ltd.) at Lautoka, Ellington and Labasa. The international airport at Nadi (132 miles from Suva by road) is a regular point of call for the numerous aircraft travelling to and from Australia, New Zealand, Honolulu and beyond. Fiji is fortunate in that only a small proportion of the capital cost of this airport and of the annual maintenance charges has been a charge on the Colony's funds. The position regarding internal services (except by air) is less satisfactory, and we consider it most important for the future development of the Colony that inter-island communications by sea should be improved and that a vigorous road policy should be pursued, especially in the two larger islands. We recognise that the cost of road construction and improvement must be considerable, in view of the mountainous nature of these islands, but we can see no future for the Colony until the main road system is improved and feeder roads are built to open up country which is at present practically inaccessible."

324. There are 1,170 miles of " proclaimed " roads in Fiji, maintained by Public Works Department. In addition there are 155 miles of unproclaimed roads. City, Town Councils and Township Boards are responsible for the maintenance of roads within their boundaries other than main roads.

TABLE 29

ROADS 1964

	Viti Levu and Ovalau	*Vanua Levu and Taveuni*	*Total*
Main Roads	453	210	663
Secondary Roads	102	97	199
Country Roads	253	41	294
Residential Roads	13	1	14
			1,170
Unproclaimed Roads		..	155
		Total ..	1,325

325. Total Government expenditure on new roads amounted to £760,000 in 1965 and on road maintenance to £545,000. These figures cover not only direct costs but also an estimated allocation of Public Works Department overhead costs.

326. The carriageways are predominantly gravel surfaced. All proclaimed roads are constructed to an all-weather standard but in the category of unproclaimed roads, standards vary considerably.

327. The estimated number of vehicles on 31st December, 1965, was as follows (excluding tractors, special vehicles, motor cycles, etc.):

Cars	6,200
Taxis	1,100
Goods Vehicles	3,400
Buses	500
	11,200

328. There has been a steady growth of road traffic since 1960 by approximately 1,000 vehicles a year. During the years 1964 and 1965 the increase accelerated, and there were about 2,000 new registrations each year.

329. It is estimated that between 60,000 and 70,000 passengers travel daily by bus. Almost every motorable road in Viti Levu, Vanua Levu, Taveuni and Ovalau is served by buses. The Suva bus station handles an average of 20,000 passengers a day, excluding passengers boarding or alighting *en route*.

330. The Road Traffic Census shows that the average number of vehicles is above 1,000 a day on many sections of the gravel surfaced roads. The existing road system is in most parts inadequate for the actual traffic loading and density. Various attempts have been made to produce a figure beyond which it is uneconomic to maintain gravel roads. The British Road Research Laboratory Paper BOR 100 of April 1964, states:

> " It appears to be economic to upgrade from gravel to bitumen surface on main roads at about 100 v.p.d."

It is not possible to set a universal standard as each case varies with its own special conditions; i.e. climate, available materials, etc. For Fiji the Public Works Department takes 300 vehicles per day as a more realistic figure. On this showing more than half of Fiji's road system is at an uneconomic standard.

331. The nature of the country demands a large number of road bridges. Many of these have been re-constructed to H20 S.16 loading and double-lane carriageway width, particularly on the Principal Highway between Suva and Lautoka and Ba. All bridges on new development main roads have been constructed to the same loading but are single-lane width. A very considerable number of old single-lane width timber decked bridges still exist on Principal Highways, Main and Secondary roads, but a fair proportion of those on the Principal Highways can carry H20.S16 loading.

AIR

332. Air traffic has developed rapidly in recent years, especially since the expansion of Nadi International Airport in 1960. In 1964, about 35,000 passengers were carried by the international airlines and 62,000 passengers by Fiji Airways on its local and regional flights. Nadi Airport is operated by the South Pacific Air Transport Council (SPATC), of which the United Kingdom, Australia, New Zealand and Fiji are members, while the remainder of the airfields are run by the Fiji Government.

333. Nadi Airport is an important link for air services in the South Pacific. It is being used by many inter-continental jet flights; airlines with regular scheduled services are Qantas, BOAC, Pan American, UTA (France), Air New Zealand, Canadian Pacific, Air India, Polynesian Airlines (Samoa), and Fiji Airways (domestic and regional flights). It is run on behalf of SPATC by the New Zealand Department of Civil Aviation. However, it is intended that responsibility for the operation of the Airport should be progressively transferred to the Fiji Government. A start will be made on this in 1966 and 1967 with the transfer of responsibilities for the stores supply organisation, the works services, and the supply of electricity. A programme of training of local staff has also commenced which is complementary to the programme for the transfer of responsibility.

334. The Nadi main North/South runway is 10,400 feet long by 150 wide of concrete construction. The Terminal building is designed to handle 400 passengers at any one time. The staff totals about 500, including telecommunications services, maintenance and mechanical staff and the Meteorological Section.

335. There are five Government aerodromes and 3 private aerodromes. Four further Government airstrips are planned at Kadavu, Lakeba (Lau Group), Vanua Balavu and Rotuma.

TABLE 30

GOVERNMENT AERODROMES

	Runways feet	
	Length	*Width*
Nausori	6,000	150
Labasa	3,300	150
Savusavu	3,300	150
Matei ..	3,300	150
Levuka	2,000	150

336. Nausori Airport is a South Pacific Regional Airport and the operational base of Fiji Airways. Flights from Nausori operate to Tonga, Samoa, Gilbert and Ellice, British Solomon Islands Protectorate, Noumea and Honiara, in addition to domestic flights within the Colony. It has been considerably developed, including the construction of a new control tower and a modern Terminal building. The Airport is equipped for night flying. An N.D. Beacon is installed at Nausori and instrument approaches can be made. A large amount of new Radio equipment has been installed so that the Airport is now well equipped. The present cost of Government aerodromes maintenance is about £F13,000 per annum, plus £F10,000 for the Crash Fire Services.

SEA

337. Inter-insular shipping consists mainly of the movement of 40,000 tons of copra from the islands to Suva, and of a corresponding movement of trade goods from Suva to the islands. The trade is carried on by a variety of ships, to a large extent on a semi-barter basis. The bigger ships are usually owned by the large commercial operators dealing themselves in copra, while the small ships carry on their business in the smaller and remoter islands for the earnings of freight income only.

338. The present system of shipping is rather inefficient and expensive, thereby inhibiting economic development. The main reasons for this are the inadequacy of the shore operations, and the composition of the inter-insular fleet.

339. There are three ports of entry into Fiji: Suva, Lautoka and Levuka. Suva is the principal port and with its fine natural harbour it can accommodate almost any vessel afloat. Work on the reconstruction of the wharf at Suva was completed at the cost of £F2·5 million in the middle of 1963. The work was carried out by an overseas contractor under the supervision of a London firm of consulting engineers and consists of a sheet piled retaining wall plus a reinforced concrete wharf deck supported off pre-stressed concrete piles.

340. The wharf facilities at Suva comprise the main King's Wharf some 1,600 feet long. For three-quarters of the length a depth of 40 feet at low water is available for shipping and 34 feet at low water along the remainder. At the North end there is a deep water berth 600 feet long with 31 feet depth at low water; this is known as the Walu Bay Wharf. At the South end is the Princes Wharf for use by inter-island shipping; a depth of 15 feet at low water is provided and the length is 580 feet (insufficient to accommodate about 100 calling vessels of 20 to 120 feet in length). The total storage capacity of the wharf sheds is 13,000 tons. There are two other small sheds for inter-island cargo at the Princes Wharf.

341. Wharf facilities at Lautoka were completed in 1961 and cost about £F1·5 million. The wharf consists of an L-shaped jetty, with an approach road some 1,200 feet long, and a head approximately 460 feet by 250 feet. This head is of reinforced concrete construction supported by pre-stressed concrete piles. Dolphins are provided for deep sea vessels to moor alongside the outer face, where there is 34 feet depth at low water. In addition, the 250 feet long North-Western face has been dredged to 25 feet depth to provide a berth for medium sized overseas vessels, and the inner face is dredged to 15 feet to provide a 400 feet berth for local vessels. The head carries a storage shed with a floor area of 43,000 sq. feet. Nearer the shore, reclamation provides an additional area for open storage and for other small ancillary buildings, together with an area available for private, commercial and industrial development.

342. Levuka, the Colony's third port of entry, is now used mainly by the Japanese Fishing Company established there in 1964. There is a Government-owned wharf, mainly of concrete but partly of wooden construction which offers berthage accommodation for medium-sized overseas vessels up to 420 feet in length and drawing up to 29 feet of water. Berths are also available for a number of small vessels of up to 15 feet draught. Double track rails lead from the wharf to the Customs shed and to the bulk stores of the larger firms. Rail push trucks, which are the property of the Government, are available for conveying cargo from vessels to storage sheds. Government storage facilities consist of one enclosed shed (83 feet by 34 feet) for the receipt of overseas and inter-island cargo. The anchorage at Levuka is fair and can accommodate four medium-size overseas vessels.

343. The outports are Vatia, where cargo is discharged for the gold mines; Ellington and Labasa, where coal and mill stores are discharged and sugar loaded.

344. The two new slipways at Suva were completed in 1962. One is of 500 tons capacity and the other of 1,000 tons capacity. A third slip of 150 tons capacity was brought back into service in 1965. A repair berth 400 feet long with a dredged depth of 10 feet at M.L.W.S. adjoins the slipways.

345. In Fiji waters there are about 40 lights; this total includes leading lights. Three of the lighthouses have permanent full time attendants and a number of the smaller lights are attended in so far as they are kerosene lanterns which are filled and relit at frequent intervals. The remainder are unattended automatic AGA lanterns with acetylene gas burners and sun valve operation. The Washington light although fully automatic has a permanent attendant because of its vital position.

INVESTMENT IN TRANSPORT

346. Investment in transport, specially in infra-structure, needs direction and purpose based on a long-term plan. The formulation of a phased policy, embracing road, air and sea transport, must be based on a comprehensive review. It is Government's intention that the relevant studies be made. In the meantime, transport development will be guided by the best assessment of needs that can be made. Investment is defined as " net " investment, excluding replacement.

347. *Roads*—A tentative programme only for roads and bridges can be prepared for the period 1966–70. Existing construction capacity must be utilised and the trained labour force employed during the interim period until a long-term programme has been agreed. Work will, therefore, continue along existing lines, which can be expected to deal with obvious roading requirements. Road building capacity can deal with a work volume of about £F700,000 a year.

348. *Suva–Nadi Road*—The existing Suva–Nadi Road was completed in 1938. There was no design or any particular specification for the road, and it followed more or less the line of the original Fijian tracks. Over the years the road has become widened and improved in places, but it is still narrow and winding with a gravel surface now completely inadequate for present traffic. The road is subject to frequent flooding and landslips which seriously interrupt traffic. Despite constant maintenance, the standard of the road is deteriorating due to the substantial increase in traffic density and speed. The reconstruction of the Suva–Nadi Road is regarded as of high priority; but it cannot be undertaken unless large-scale financial assistance is obtained on favourable terms. Finance of this size and nature is not available from Fiji's normal loan sources. The Suva–Nadi Road links Viti Levu's two major centres of population, the sugar cane growing areas of the Western Division and the area around Suva. At the same time, it touches the Sigatoka Valley, one of the areas with the greatest agricultural development potential.

349. *Air*—The budget for Nadi Airport is as follows:—

TABLE 31

NADI AIRPORT

	1966–67	1967–68	1968–69
Maintenance and Operational Expenditure	£F736,745	£F740,321	£F730,013
Less : Revenue	355,300	360,550	370,550
Operational Deficit	£F381,445	£F379,771	£F359,463
Capital Expenditure	£F615,467	£F315,131	£F58,424

350. The relative percentage shares of the SPATC countries are as follows:—

TABLE 32

Countries	*Capital per cent.*	*Recurrent per cent.*
New Zealand	40	46⅔
Australia	40	33⅓
United Kingdom	20	20

351. The Fiji Government makes a fixed contribution of £F60,000 per annum.

352. There will also be extensions of local air facilities covering the expansion and equipment of local aerodromes. This cost, which may amount to about £F300,000 during the Plan Period, will fall on the Fiji Government.

353. It is certain that air traffic will expand at a fast rate during the period 1966–1970. Most of this increase will come from overseas travellers. It may be estimated that even now about three-quarters of the local and regional flights are accounted for by overseas travellers. From a revenue point of view, the greatest interest will centre on the increasing number of overseas passengers handled by Fiji Airways.

354. At a conservative estimate the number of passengers travelling by Fiji Airways may be expected to grow from 62,000 in 1964 to 150,000 in 1970. There is an important distinction between the local services and the regional services. The latter carry fewer passengers, but in terms of passenger miles and revenue they are even now about equal to the domestic flights of Fiji Airways. It is likely that the regional services will outstrip the domestic services in the next few years.

355. The Fiji Airways services to other Pacific island groups have served to improve the social, cultural and economic links with these places, and it is already having a marked effect on their traffic. An example of this is the route to Honiara which in 1961 was served by monthly charter flights. Fiji Airways is now operating a twice-weekly service and are having to consider the purchase of large aircraft for that purpose. One may also expect that Fiji Airways will in due course extend their route to Tahiti via the Samoa Group of islands. Likewise the Airline may operate to New Zealand via Noumea and Norfolk Island on a reciprocal basis with Air New Zealand.

356. These developments will be reflected in the need for new capital expenditure. Some of this expenditure will be for expanded airport facilities, which will be met at Nadi International Airport by SPATC and at other aerodromes by the Fiji Government. The Airlines, specially Fiji Airways, will have to buy more and larger aircraft to cope with the growth in traffic. The current air operations themselves, in terms of running costs, staff, revenue, etc., will be affected.

357. *Sea*—The formulation of a policy on inter-island shipping requires further study.

358. *Wharves*—Plans will have to be made for the future expansion of the ports of Suva, Lautoka and Levuka. Berthing facilities and storage space are proving inadequate for the developing volume of trade they will handle. The first priority in Suva may be the removal of the oil berth from its present location in order to relieve pressure on the overseas berths at the King's Wharf and also to eliminate the present fire hazard. The second priority would be the construction of additional shed accommodation at both Suva and Lautoka.

INVESTMENT IN EQUIPMENT

359. According to present estimates, 65 buses and 500 goods vehicles will be added to the existing stock of vehicles during 1966–1970. The total cost of this transport equipment may be estimated to about £F1·5 million, the import element being about £F1·4 million. The burden of this expenditure will fall on domestic private transport operators, except in so far as it may be shown in the Estimates of Government Departments.

360. Fiji Airways will expand their fleet to cope with the forecast increase in traffic. The finance for this expenditure on equipment is expected to be obtained from overseas.

361. Investment in inter-insular shipping cannot at present be forecast in a realistic way. It is expected that policy will be formulated by the Port and Marine Department to be established.

PORT AND MARINE DEPARTMENT

362. Government is proposing to set up a new Port and Marine Department, charged with the administration of Fiji's marine affairs. In addition to dealing with the recommendations of the Safety at Sea Commission there are other problems in connection with the control and administration of sea traffic which must be dealt with.

Communications

363. The Sector Communications covers Posts and Telegraphs Department, the Fiji Broadcasting Commission and one other company. The following discussion deals only with the Posts and Telegraphs Department.

GROWTH OF REVENUE

364. In the past decade, total cash revenue, excluding free services to other Government Departments, has risen from £F177 thousand in 1955 to £F611 thousand in 1964. Postal revenue increased at the rate of 12·1 per cent. and telecommunications revenue at 17·7 per cent., giving an average annual growth rate of 14·3 per cent. During the same period, the value of free services to Government grew from £F30,400 to an estimated £F120,000. From the average growth rate 1955–1964, and given the advantage of an expanding economy, one could assume an average annual growth rate of about 12 per cent. for total revenue up to 1970, excluding free postal services.

365. The revenue of Postal Services will be assumed to grow at a rate of 10 per cent. a year between 1965 and 1970.

366. Telecommunications revenue seems fairly assured of an average increase of 12 per cent. and more, depending on capital expenditure. There is, at present, an insatiable demand for telephone services, and telephone rentals and trunk calls are certain to be the biggest earner in the future. With only 23 telephones per thousand of population, Fiji has a growth potential which could double the system by 1970. If it were not for the expense of maintaining " social " and other supporting telecommunications services to remote areas by radio and telegraph circuits, and public call offices, the rate of increase would be higher, probably over 15 per cent. Nevertheless, the public service obligations are accepted.

367. *Postal Tariff*—The present first class postage rate of 3d. for the first ounce and 1½d. for each additional ounce was fixed in January, 1960. It is unlikely that this basic unit rate can remain unchanged in the face of the average annual increase in postal services costs of 8 per cent. So far, increases have been absorbed to some extent by higher philatelic earnings and increased work efficiency, but this cannot continue much longer. A general review of the postal tariff will have to be undertaken before decimalisation in any event.

368. *Telecommunications Tariff*—Subscribers trunk dialling should be almost national by 1970, if plans can be financed. Partial subscriber trunk dialling should be in use in 1966, and will require the introduction of an entirely new tariff based on time and area location rather than on radial distance as at present. The public can expect to make cheaper trunk calls, if they use their telephones sensibly, but increased automation is expected to result in a higher number of telephones in use, a higher volume of traffic, and therefore increased revenue. Some adjustments in the scale charges for special equipment, for example private automatic branch exchanges, is likely, as that type of complex equipment has increased in price by some 35 per cent. since 1960.

369. The past and future revenue trends are summarised in the following Table:—

POSTS AND TELEGRAPHS REVENUE — TABLE 33

	Postal Services	*Telecommunications*	*Total*
		£F000	
1955	105	72	177
1956	122	79	201
1957	118	95	213
1958	124	124	248
1959	148	140	288
1960	149	170	319
1961	186	194	380
1962	212	221	433
1963	261	246	507
Average Growth Rate per cent. per annum			
1955–1963	12·1%	17·7%	14·3%

1964	290	321	611
1965	265	443	708
1966	304	509	813
1967	334	570	904
1968	368	638	1,006
1969	405	715	1,120
1970	445	800	1,245

PROJECTION OF RECURRENT EXPENDITURE

370. It is expected that recurrent expenditure will rise from about £F480,000 in 1966 to about £F630,000 in 1970, which represents an annual average growth rate of 7 per cent.

CAPITAL EXPENDITURE

371. On the Postal side, there is not much capital expenditure required. However, an urgent need exists for new post office buildings to replace the over-crowded wooden huts in country districts. For example, Rakiraki had a cash turnover of £F384,000 in 1964, handled 5,968 closed bags of mail, 1,500 telegrams, and remitted £F112,000 to the Sub-Accountant; the Postmaster and his two assistants work in one room measuring 12' x 15'.

372. On the other hand, a substantial plan for Telecommunications development has been prepared in detail. The Department's first plan was produced in 1959, the second in 1961, and the third in 1963. It has never been possible to meet fully the demands made for additional and improved Telecommunications services, due principally to the limited financial resources available. In the fifteen years from 1946 to 1959; about £F700,000 was spent on the purchase and installation of Telecommunications equipment. In the following six years 1960 to 1965, about £F1·3 million was spent. This puts into perspective the proposed expenditure of about £F2·8 million during the Plan period 1966–1970.

373. The Telecommunication plan can be summarised as follows—

TELECOMMUNICATIONS PLAN 1966–1970 TABLE 34

	£F	£F
Public Telephone Service—		
Local Exchange Network	1,693,000*	
Trunks and Junction cables	481,500	
		2,174,500
Public Telegraph Services		103,000
Telex		63,000
Leased Circuits		10,000
Radio Services		341,000
Marine, Inter-island and External		
Miscellaneous Services—		
Main Station	7,800	
Minor VHF	32,500	
Buildings	52,000	
Vehicles	6,900	
Quarters	19,500	
Testing Equipment and Tools	20,000	
		138,700
		2,830,200

* Includes £F172,000 for buildings

REVENUE AND EXPENDITURE BALANCE

374. The indications are that Post and Telecommunications services will be viable and produce, in fact, a substantial surplus. Projections prepared by the Posts and Telegraphs Department may be summarised as under:—

REVENUE AND RECURRENT EXPENDITURE TABLE 35

£F000

	Postal			Telecommunications		
	Revenue	Recurrent Expenditure	Recurrent Surplus	Revenue	Recurrent Expenditure	Recurrent Surplus
1966	304	201	103	509	281	228
1967	334	217	117	570	304	266
1968	368	231	137	638	317	321
1969	405	251	154	715	337	378
1970	445	270	175	800	360	440

OVERALL SURPLUS TABLE 36

£F000

	Overall Surplus	Combined Recurrent Surplus	Capital Cost		
			Postal	Service of Telecommunications Loans	Total
1966	207	331	75	49	124
1967	248	383	24	111	135
1968	257	458	11	190	201
1969	273	532	14	245	259
1970	318	615	14	283	297

375. According to the revenue and expenditure estimates it should be possible to meet not only recurrent costs but also nearly half of the capital costs from annual receipts. There is, of course, bound to be a certain amount of conjecture in these matters. The figures for servicing of loans do not include the servicing costs of loans already raised.

376. The services provided by Posts and Telegraphs Department are paid for by the customers who make use of them. They are not free services met out of general public revenue. This is an important point in considering the financial resources to be made available for expansion in communications. It can be argued that no limit should be placed on any service as long as the public demand meets its full costs, provided it is possible to raise the finance needed without affecting the financial requirements of other sectors. This sector is, therefore, subject to Public Utility criteria.

MANPOWER

377. Localisation of staff is well advanced, but it is unlikely that the Posts and Telegraphs Department can be fully localised for some time to come. It is anticipated that the Departmental training programme will produce enough technicians to fill all middle grade technical posts by 1972.

378. The recruitment and training of Telecommunications technicians (aeradio, P. & T., broadcast, etc.) should be rationalised under a unified scheme. The Telecommunications Training School should be gradually expanded to provide all the necessary facilities, without however duplicating the work of the Derrick Technical Institute. Special overseas courses will continue to be necessary. There is also a need for a small Postal and Accounts Training Unit

TELECOMMUNICATIONS

379. It is generally recognised that, where a demand for Telecommunications services exists, the replacement of an inadequate number of low grade Telecommunications channels by sufficient circuits of an acceptable standard will invariably result in a marked increase of traffic and in the number of telephone subscribers. This factor may be expected to influence the future trend of telephone growth in Fiji, because the introduction of satisfactory channels has only begun during the past three years on a limited scale.

380. The Suva area is served by three Exchanges at Suva, Samabula, and Laucala Bay (owned by the RNZAF). The main Suva Exchange is only capable of further extension by 400 lines and its present spare capacity is 500 lines. Its ultimate capacity will, therefore, be exhausted in three years' time at the present rate of development, and planning must thereafter include the construction of a new Central Exchange. The entire capacity of the Samabula Exchange has been exhausted some time ago, and there is a waiting list of several hundred applicants. The Laucala Bay Exchange at present serves only the RNZAF with 200 lines. At Lautoka, a modern 1,800 lines crossbar Exchange is in the course of construction. Crossbar exchanges are also completed at Nadi, Namaka and Levuka. The remaining twelve manual Exchanges, nearly all of which serve rural development areas, are worn out, long overdue for renewal and have little or no capacity for additional lines.

381. *Trunk and Junction Network*—The main microwave trunk route from Suva to Lautoka is virtually complete and is due to be opened shortly. This route forms the main artery of communication from Suva to Lautoka, and it also gives access to the break out point at South Ridge, in the centre of Viti Levu from where groups of circuits will be directed to Ba, Tavua, Sigatoka and Rakiraki. This centre station is important for its wide coverage and its consequent potential for rural V.H.F. links to development areas.

382. Apart from the main trunk route referred to above, together with its associated spur routes, the network linking the remaining rural Exchanges is of a minimal standard, requiring extensive replacement before the Exchanges can accomodate new subscribers or be converted to automatic working. The rural network in general suffers serious congestion.

383. *Other Services*—Fiji's Telecommunications in general are developing around the main radio bearer system which comprises the vehicle into which all services are progressively being integrated. Considerable re-equipment and modernisation is, however, required to the telegraph radio and other apparatus serving the less developed parts of the country,

384. At the present time it is necessary to make a 50-year projection as well as prepare a 5-year plan. It is important to ensure that the numbering plan adopted for current automatic schemes will meet the requirements of long-term planning and also allow the national network ultimately to be accessible to subscribers in other countries. The existing 5 digit network in Fiji has a limited capacity and a 6 digit network will be an absolute necessity in twenty years. The projected new Central Exchange for Suva (1970–1975) should be planned on this basis.

385. A projection has been made showing that the number of telephones will rise from about 12,000 in 1966 to about 120,000 in 2015.

Construction and Engineering

386. This industry will be responsible in a certain measure for the implementation and profitability of business and development projects. A modern Building Industry, large enough to handle the expected volume of work, can do much to help development along.

387. It may be hoped that forward planning will give guidance to the industry and contribute to the cutting out of delays. It has been the experience that building work can often not be done on time. Whatever the reasons for this, earlier knowledge of building intentions should be helpful.

388. The Public Works Department may be treated as part of the Building Industry to the appropriate extent. A sharp demarcation line cannot be drawn between the public sector and the private sector of the industry.

389. The total volume of building work is likely to be of the order of £F5 million a year during the period 1966–1970. Assuming that a building operative can do about £F1,000 of work a year, this means a building labour force of about 5,000.

390. Questions have been raised on training and trade testing. These are specific matters and perhaps outside the scope of a general Development Plan. However, productivity, training and wages are intimately related to each other. Facilities are available for apprentice training in building skills; they should be fully used. There is also the possibility of setting up special short courses to upgrade experienced tradesmen.

Public Utility Electricity Supplies

391. Development of electricity supplies has in the past depended on the initiative of local businessmen to apply for licences to generate and supply electricity. The two exceptions to this type of development have been Suva and Lautoka; in Suva the City Council operates the public supply and in Lautoka the Public Works Department has run a Government-owned station.

392. The conditions created by past development have not been entirely satisfactory for a number of reasons, one of which is the lack of standardisation of plant which precludes the possibility of supply inter-connections.

393. In order to improve electricity supplies, the overall power requirements of Fiji have to be considered in a new light. Government has decided that a Public Electricity Authority is to be formed, and this will be set up during the course of 1966. The benefits expected from this new departure are the improvement of plant utilization, standardisation of equipment, reduction of tariff differentials and improved technical knowledge.

Three areas may be distinguished:—

TABLE 37

	Estimated Unit Sales 1966
Southern Area—	
Suva City Council	33,500,000
Sigatoka	157,000
Western Area—	
Lautoka	4,000,000
Nadi Town	500,000
Nadi Airport	5,200,000
Northern Area—	
Labasa	470,000
Levuka	350,000

Experience has shown that undertakings with annual units sales of less than 10m. units are very slow to develop due to lack of capital and technical competence. Thus any Authority in Fiji must be based either on the inclusion of the Suva City Council supply or the integration of the Western Area stations. In present circumstances, the establishment of an Electricity Authority hinges on the integration of supplies in the Western Area, which necessitates the transfer of Nadi Airport station to the new Authority.

394. Agreement has been obtained with suitable safeguards from the South Pacific Air Transport Council members who control the Airport, to transfer the Nadi Airport power supply to the Authority. The Authority will include the three Western Area stations linked in one system; and it will also include Labasa, Levuka and Sigatoka as separate stations.

395. The setting up of the Electricity Authority in the form proposed will involve the taking over of the power supplies in Nadi Town, Labasa and Sigatoka which are at present in private hands. Compensation will have to be paid.

396. The Electrical Section of the Senior Mechanical Engineer's Yard (Public Works Department) is at present carrying out public maintenance and installation work. The value of this work is running at about £F40,000 a year; and it will grow over time. It is proposed that this section will be transferred to the Electricity Authority. After the transfer, electrical maintenance and installation work for Government will be carried out by the Authority on a contract basis, mainly in the Southern Area.

397. The Electricity Authority will be viable from the start. Projected recurrent expenditure in 1970 will be about £F180,000 (including interest and depreciation charges), and revenue will be about £270,000. It should not be difficult, therefore, to raise the necessary capital for expansion. Figures for recurrent and capital expenditure as well as for revenue are given in the following table.

TABLE 38

ELECTRICITY AUTHORITY

PROJECTIONS 1966–1970

	1966	1967	1968	1969	1970
			£F000		
Recurrent Expenditure—*					
Lautoka	60·0	....	....	....	76·5
Nadi Town	10·2	....	....	....	....
Nadi Airport ..	69·6	....	....	....	80·3
	139·8	....	....	....	156·8
Labasa	12·8	..	..	....	14·0
Levuka	8·5	....	....	....	10·9
Total ..	161·1	....	....	....	181·7
Capital Expenditure—					
Lautoka	57	15	22	21	54
Nadi Town	..	..	10	..	..
Nadi Airport ..	3	4	30	3	30
	60	19	62	24	84
Labasa	2	12	20	4	4
Levuka	3	5	..	..	..
Total ..	65	36	82	28	88
Revenue—					
Lautoka	77	....	....	....	131
Nadi Town	16	....	....	....	....
Nadi Airport ..	69	....	....	....	103
	162	....	....	....	234
Labasa	20	....	....	....	26
Levuka	10	....	....	....	13
Total ..	192	....	....	....	273

*Including interest and depreciation charges.

398. The power situation for all public supplies in the Colony is projected as follows:—

TABLE 39

PUBLIC UTILITY ELECTRICITY SUPPLIES

PROJECTIONS 1966–1970(1)

	1966	1967	1968	1969	1970
			£F000		
Recurrent Expenditure(2)—					
Electricity Authority	161·1	....	....	....	181·7
Suva	410·0	....	....	....	480·0
Total ..	571·1	....	....	....	661·7
Capital Expenditure—					
Electricity Authority	65	36	82	28	88
Suva(3)	170	170	170	170	170
Total ..	235	206	252	198	258
Revenue—					
Electricity Authority	192	....	.....	....	273
Suva	480	....	....	....	550
Total ..	672	....	....	....	823

(1) Excluding Sigatoka.
(2) Including interest and depreciation charges.
(3) Total expected expenditure shown on straight line.

399. The Electricity Authority will be set up in 1966 with a capital investment of £F500,000, wholly subscribed by Government. This investment will be represented by the take-over of the existing Government assets of the Lautoka and Levuka supplies, valued at £177,000. In addition, Government will make a cash investment in the Electricity Authority of £F323,000.

400. The Nadi Airport power house with all generating and ancillary equipment and land will be transferred by the SPATC member countries to the Authority without payment. In compensation the Authority will sell to the Airport 50 million units at a preferential price of 2·7d. per unit, compared with a total unit cost of 3·203d. This generous gesture by SPATC member countries has the effect of increasing the capital of the Authority by way of assets by some £F200,000.

Public Utility Water Supplies

401. The twelve main centres of population in Fiji are provided with piped and treated water supplies. The supplies are primarily designed and intended for domestic consumption but wherever conditions permit they also provide water for industry and commerce. So far it has never been necessary to refuse requests for water from any industrial consumer whose place of industry is within any of the reticulated areas. Wherever necessary and economic, special arrangements have been made to supply industry and it is intended that this policy should continue. Nevertheless occasions may arise where demand in some proposed new industry is of such magnitude that it cannot be met. If this occurs special provisions will have to be made as such contingencies are not covered in this plan.

402. For economy reasons the water mains are not designed to carry the copious flows required for fire fighting, but hydrants are fitted at regular intervals and what water is available may be used for fire fighting.

403. The main characteristics of the twelve supplies show many individual differences. Daily output varies from 3·5 million gallons per day in Suva to 40 thousand gallons per day in Savusavu. Total daily output for the thirteen supplies is about 6·0 million gallons per day.

404. Quality of water treated varies from a good gravity spring water in Labasa to a very turbid pumped water at Tavua. Naturally this results in varied production and treatment costs.

405. Considered individually some of the supplies are uneconomic. That is, the overall cost of water is so great that rates set to recover the full cost would be beyond the means of the consumers. However, when the twelve supplies are considered on one account, the overall production cost per thousand gallons is much reduced, and it is possible to fix rates low enough to be within the means of consumers and still cover the total production cost, including capital charges, maintenance costs and all overheads.

406. All connections to the water supplies are metered individually, and consumers pay for water actually consumed. The rating system is devised to keep the cost to the domestic consumer as low as possible. To achieve this the first 15 thousand gallons used in any quarter are charged at a lower rate than the excess above that amount. However, it is intended that any reduction of production costs which results in a reduction in rates should be used to reduce the higher rates rather than reduce the lower rate still further.

407. During the last few years funds have been provided annually for the extension of water mains into new estates and to prospective consumers within the water supply areas. Though only spent on extensions which would bring in an economic return in terms of water rates collected, the funds have been inadequate and there is still a backlog. However, additional funds were provided in 1965 and the position has improved slightly.

408. To summarise, urban water supplies in the Colony are looked upon mainly as social services intended to preserve the health and add to the amenities enjoyed by the public. Plans for expansion should have the extension of these amenities as their end result. Although urban water supplies are primarily a social service, they are also needed for industry and every effort must be made to supply industry.

409. Total designed capacity of the supplies if 7,915,000 gallons per day, and the total daily consumption through service meters is 4,764,000 gallons. Thus, neglecting waste between main supply and consumer, there is a spare capacity of some 3 million gallons per day. Unfortunately, waste does occur and must be considered. The waste of about 12½ per cent in Suva is about as low as one can hope to get it and corresponds with what one would expect in Britain. Waste in Lautoka, the second largest supply, is about 20 per cent. and could probably be reduced.

410. Some of the supplies have sufficient spare capacity to cover normal development in the next five years. Suva, Lautoka and Nadi, however, will need major extension.

CHARGES

411. The annual charges in 1964, i.e. the cost of having and running water supplies, were £F286,205. It can be shown that this charge represents approximately 3s. 4d. for every 1,000 gallons consumed.

412. The total charges are made up of £F158,373 net capital charges on a total capital investment of £F3,188,388, plus £F90,500 maintenance and operation, plus overheads and administration.

REVENUE

413. Total revenue received from the sale of water had a theoretical value of £F309,396 in 1964.

This is made up as follows:—

	£F
Value of water actually sold	212,719
Value of free supplies	17,432
Value used by Government	79,245
Total	£F309,396

FORECAST OF DEMAND IN 1970

414. Over the last few years demand for water has never been fully satisfied. This has been due mainly to financial restrictions. Headworks and treatment plants have had sufficient capacity to meet fully the existing demand even in a normal dry season. But it has never been possible to provide all the extensions which come under the heading " economic ". An extension is considered to be economic if the annual return from it, in water rates, amounts to 12½ per cent. of the cost of the extension.

415. Due to insufficient funds many of these proposed economic extensions have not been carried out. Consequently, the rate of growth of the water supplies has been influenced by finance rather than by demand. Graphs of consumption thus reflect money provided, rather than growth of demand. Therefore, it is difficult to estimate the future rate of increase of demand. It certainly cannot be done by projection.

416. However, additional funds, over and above those normally provided, were available for extensions in 1965 and 1966. Thus there will be a rapid increase in consumption over these two years. By the end of 1966, part of the backlog will be made up. Thereafter, it is hoped that consumption will be influenced mainly by demand.

417. Total demand will depend to a large extent on the growth of towns. Personal demand is influenced by the prosperity of the individual and also by health education.

418. All factors point to an increasing demand, and after the initial 2-year period (1965–66), when the increase will be rapid, consumption will continue to increase at a rate which will to a large extent depend on the economy of the country. The increase is expected to be 40 per cent. between 1963 and 1970.

CAPITAL PLANS

419. Capital expenditure of over £F1 million will be needed over the period 1966–1970. This includes a substantial expansion of the Suva water supply.

420. In Suva the existing water supply system was designed on the probability that the flow from catchments would not drop below 5·5m.g.d. even in a dry period likely to occur not more than once in 50 years. This was of course an estimate based on the very slender hydrological records available. It now appears to have been wrong. During the period 23rd December, 1965 to 11th January, 1966 the total flow from catchments was 3m.g.d. This could be an occurrence likely to happen only once in a hundred years, but we cannot risk waiting to find out. The next time it happens will be more serious because every year the demand increases and we are by no means certain that 3m.g.d. is the absolute minimum. The flow could fall still more. If we wish to guarantee a sustained supply of water to Suva we must take immediate steps to exploit an additional source.

421. At the height of the drought on 31st December, 1965, the Waimanu river at Vatuvula was roughly gauged. The flow registered was about 75m.g.d. It should, therefore, be safe to assume that the Waimanu could provide Suva with all its water requirements for a considerable time to come.

422. The construction of a diesel powered pumping station on the Waimanu should be included in the Plan 1966–1970. The pumping station will discharge through a 24" pipeline into the existing raw water reservior at Tamavua which will supply the treatment plant. The pipeline will follow the route of the existing road along Savura creek which will be extended 2½ miles to the Waimanu. Arrangements will be made on the 24" pipeline to enable it to be used as a gravity pipeline feeding from Savura creek when there is sufficient water in the creek.

423. Diesel plant has been selected because in its early years it will be used infrequently and the electricity tariff could not possibly be favourable. There is also the possibility that in future years, when the station is required to be in full-time operation, flooding of the Waimanu could interfere with the electricity supply.

424. The pumping installations will be designed for 8mg.d. with full development. This should satisfy the raw water demand at Suva.

425. At the present rate of increase, the flow through the treatment plant will equal the design figure of 4m.g.d. by 1968. However, it should be possible to overload the plant up to 4·5 m.g.d. without ill effects. This should carry us to the end of 1971, and before the end of 1971 the treatment capacity must be augmented. The existing plant is designed to allow of its extension in units of 4m.g.d. It is proposed to increase it so that the total output will be 8m.g.d.

CHARGES IN 1970

426. Capital expenditure amounted to approximately £F90,000 in 1965. In 1966–1970 a further £F1·2 million should be spent on capital improvements. Thus the total 1965–1970 should be about £F1·3 million. Capital charges on this at 7 per cent. for 50 years amount to approximately £F95,000 per annum.

The net capital charges in 1964 were £F158,000.

Therefore in 1970 they will be £F253,000.

Maintenance and operation is expected to cost £F100,000 in 1970.

Therefore net charges, capital plus maintenance, will amount to £F353,000.

Allowing 15 per cent. for Administration and Overheads on £F353,000, total charges will be £F406,000 in 1970.

REVENUE IN 1970

427. At present water rates and on the basis of detailed assessments for Suva, Lautoka and Nadi, the increase in consumption for these three supplies will be 40 per cent. between 1963 and 1970. An increase in revenue of this order would bring it up to £F404,000 without taking into account the other 9 small supplies.

428. It is thus estimated that, with water rates at their present level, revenue and expenditure will balance in 1970.

RURAL WATER SUPPLIES

429. Rural supplies are not normally owned or run by Government. Some villages have received Government assistance towards the cost of installing supplies, and there is a scheme in operation at present whereby Government provides one-third of the cost of materials plus technical and skilled assistance. Upon completion these supplies become the property of the villages. They are not revenue earning. The sum of £F8,000 has been set aside annually, and in 1965 for the first time the whole contribution was used.

430. It is impossible to anticipate whether the villages will show more interest in the scheme in the future than in the past. However, renewed attempts to put the scheme over are being made by the Medical Department and District Administrations. It is suggested that the subsidies for rural water supplies should be increased.

Education

PRIMARY EDUCATION

431. It is the aim of primary education in Fiji to provide schools for all who want them. In 1965 the total primary roll of 93,983 represented 92·1 per cent. of the estimated 102,000 children aged 6–13 in that year. By 1970 the primary roll is expected to reach 119,700.

432. Compulsory primary education may become a reality for the six-year age-group 7–12 by the mid-1970's, provided a second Government teacher-training college is established in the early 1970's. Compulsory education may have disadvantages, however—

(1) in Fiji it would presuppose complete abolition of fees—it is impracticable to compel a child to go to, or to remain at, school and insist on his paying fees;

(2) a law which is not enforced rapidly falls into disrepute; and the enforcement of compulsory education in a widely-scattered territory like Fiji would involve paying salaries and travelling expenses to a substantial army of attendance officers—money which would almost certainly be better spent in providing more and better facilities for those children who do want to go to school.

433. It is also educational policy to reduce fees as and when such reductions become financially possible. The substantial reductions, operative from January 1965, in tuition fees in Government primary schools and in salary contributions by School Committees in non-Government primary schools represent a big step forward, and it is hoped that the next steps will be—

(1) provision to enable children attending non-Government primary schools to obtain the same sort of remission of fees as is available to children attending Government primary schools, thus ensuring that no bright but impecunious child is denied a primary education in any school through inability to pay;

(2) the gradual abolition of any contribution whatsoever by School Committees towards teachers' salaries; and

(3) the gradual issue to all primary schools, free of charge, of approved textbooks, readers and certain items of teaching equipment.

434. It must be remembered, however, that even when salary contributions have been abolished and textbooks, etc., are issued free, School Committees will still have to meet the cost of maintaining existing buildings, furniture and equipment and of providing at least a part of the cost of new buildings, furniture and equipment.

435. In 1965 the 93,983 children in primary schools were taught by 2,736 teachers of whom 494 were untrained. The pupil/teacher ratio was thus 34½:1 and the ratio of trained to untrained teachers was 4½:1. The aim of the primary teacher-training programme during 1966–1970 must, therefore, be to produce teachers for an extra 25,700 children without letting the pupil/teacher ratio exceed 35:1, and without increasing the proportion of untrained teachers. Thus 636 additional trained teachers will be required by the beginning of 1970. Plans for producing this number must be made.

436. An increase of 25,700 children over 5 years demands the equivalent of at least 125 additional classrooms each year. In addition, about 120 additional classrooms are required immediately to offset present overcrowding. Finally, a survey will be undertaken to ascertain the physical condition of all existing 2,500 primary school classrooms—many of which are constructed in temporary materials—but in the meantime it is reasonable to assume that at least 75 need to be rebuilt in permanent materials each year. Thus about 230 new primary school classrooms will have to be built each year during the period 1966–1970. The cost of such a programme is about £F230,000 on materials a year. The use of mass-produced prefabricated buildings, imported in bulk free of duty, would go some way towards reducing expenditure on primary school classrooms.

437. Out of a total of 581 primary schools, only about 20 are managed by Government. The existence of Government schools creates various anomalies, and it is, therefore, recommended that Government should consider handing over some of its remaining primary schools either to properly-constituted local authorities or to responsible School Committees.

MIDDLE SCHOOLS

438. The establishment of a new type of school is proposed—perhaps called a " Middle " school—which would replace the present primary Classes 7 and 8 and eventually take its pupils up to Form 4 level. Fiji is one of a comparatively small number of countries which provide an 8-year primary course. Most countries provide a 6-year primary course, at the end of which a child is regarded as physically and mentally ready for a change in the method of learning. There is growing evidence in Fiji that the present academically-biased syllabus now in use in Classes 7 and 8 of the 8-year primary course is ill-designed to equip the majority of children, who do not continue with their education, for playing an effective part in the life of their country.

439. It is recommended that the idea of a 6-year course be accepted in principle and that a start be made towards implementing it in the period 1966–1970. Once the scheme is fully operative, a child completing his 6-year primary course would have two options:

(1) if he wanted to undergo a full secondary course (whether academic or technical) up to or beyond School Certificate, he would sit the secondary school entrance examination during his Class 6 year and, if successful, would enter the secondary school of his choice at Form 1 instead of at Form 3 as now; or,

(2) if he was not interested in, or failed to gain admission to, a full secondary course he would automatically be admitted to a Middle school, and there undergo a two-year (Form 1–2)—or eventually a four-year (Form 1–4)—course specially designed to provide a more practical training.

440. The courses to be followed in Middle schools would be essentially practical ones. It would be undesirable that all schools of this type should be of the same pattern. The needs of rural areas, for instance, differ from those in urban areas. Four different types are, therefore, recommended. The building and staffing of the Middle schools will have to be carefully prepared. A start should be made during the period 1966–1970.

SECONDARY EDUCATION

441. The roll of secondary academic schools in 1965 was as follows—

Form 3	3,210
Form 4	2,717
Form 5B	829
Form 5A	620
Form 6B	161

The number of children who passed the Secondary School Entrance Examination in 1964 was 1,223, and the 1965 Form 3 roll above clearly shows the extent to which children who failed the examination are being admitted into unaided academic secondary schools. The heavy concentration of pupils in Forms 3 and 4, compared with the very small number in the Fifth Forms, shows clearly the effect of admitting into secondary academic schools children who are incapable of obtaining the full benefit from an academic course.

442. The key to Fiji's development and localisation programmes lies in the expansion of its Fifth and Sixth Form facilities. Even if the 1970 " targets " of 900 passes in the School Certificate examinations and 300 passes in the University Entrance examinations are achieved, demand will still greatly exceed supply. Altogether 13,130 pupils are expected to leave school for good in 1970. Of these, only about 565 will possess School Certificate and 300 University Entrance qualifications. The projections to 1975 give a rather more hopeful picture—795 school-leavers with the School Certificate qualification and a further 425 with passes in the University Entrance examination. But even so the currently-planned expansion of Fifth and Sixth Form work will have to be continued and accelerated throughout the 1970's.

443. Thus the main aims in the period 1966–1970 must be:

(1) to provide non-academic as well as academic courses in secondary schools, so that they can more adequately cater for those children whose abilities lie in practical rather than in academic subjects;

(2) to expand greatly and improve Fifth and Sixth Form facilities; and incidentally

(3) to reorganise the salary structure for secondary teachers.

444. It is estimated that the total secondary roll (excluding Forms 1 and 2) will be about 11,300 by 1970, made up approximately as follows—

Government schools	1,700
Aided schools	6,000
Unaided schools	3,600

In calculating staffing requirements it is assumed that—

(1) the pupil/teacher ratio will remain at about 15:1 in Government schools, improve to about 20:1 in aided schools, and improve to about 25:1 in unaided schools; and,

(2) the proportion of graduate to non-graduate teachers will remain at about 50:50 in Government and aided schools and improve to about 40:60 in unaided schools.

On this basis, additional trained graduate teachers will be required at an average rate of about 20 a year. It is most unlikely that this target will in fact be achieved, particularly in the first-half of the Plan period. Much will depend on the extent to which private students now attending overseas universities can be prevailed upon to take up teaching as a career, and on the salary structure.

FIJIAN SECONDARY EDUCATION

445. Fijian secondary education presents a special problem, and drastic measures are required if enough qualified Fijians are to be produced to occupy a due share of senior positions in the public and private sectors.

446. The underlying cause of the unsatisfactory state of Fijian secondary education is the very scattered nature of the Fijian population and hence of Fijian primary schools. The result has been that a Fijian primary school is normally half the size of an Indian primary school, and the upper classes are in general so small that in nine cases out of ten Fijian Class 8's must share their teachers with one, two or even three lower classes. Visits of inspection and assistance to many Fijian primary schools are made much less frequently than is desirable; there were for instance 130 schools which in 1965 could only be reached by sea. Thus many Fijians attending secondary school must, almost of necessity, be provided with boarding facilities—and prior to 1965 boarding fees in Government secondary boarding schools were far beyond the reach of the average Fijian.

447. It is impracticable to solve the problem of Fijian education overnight. One approach is the amalgamation of small neighbouring schools, the establishment of Form 1–2 facilities in secondary schools, and the creation of a network of Middle schools. Another is the conversion of Queen Victoria School into a large Form 1–2 boarding school and the establishment of a new secondary boarding-cum-day school at Nasinu.

TECHNICAL AND VOCATIONAL EDUCATION

448. It is increasingly evident that greater emphasis must be placed on the production of school-leavers who are competent to enter industry and commerce as trainees and who, after further special training, can become the skilled manpower necessary for Fiji's development. It is expected to raise the enrolment in technical and vocational courses as follows—

	Actual 1965	*Estimated* 1970
Full-time technical and vocational courses	696	1,080
Apprentice training (part-time, day-release, and block-release)	244	650
Extension classes for tradesmen	55	50
Extension classes in commercial and professional subjects	1,029	1,580
Extension classes in other subjects	494	620
	2,518	3,980

449. Development during the Plan period 1966–1970 will centre largely upon the Derrick Technical Institute, where an expansion programme in connection with the establishment of higher education courses in appropriate fields is envisaged. By conducting courses on a block-release or full-time basis and by providing hostel accommodation, the facilities of the Derrick Technical Institute will be made available to persons living in all parts of Fiji.

450. Training is also to go forward in the existing primary schools, and the proposed Middle and Secondary Technical Schools. Suggested new subjects for training are a Nautical Training School and Hotel Training. The work of the Ratu Kadavulevu School will continue on a re-organised basis.

TEACHER-TRAINING

451. An annual average output of 164 primary teachers is not beyond Fiji's present resources; this is the requirement up to 1970. However, the introduction of a 3-year post-School Certificate course to replace the present 2-year post-Fiji Junior course is highly desirable. By making the change gradually as and when there are enough School Certificate applicants to make a full class or classes it should be possible to avoid the hiatus caused in more developed countries where the switch from 2-year to 3-year courses has resulted in a complete cessation of output in the year of the change-over. The main complication about 3-year courses is that they require 50 per cent. more accomodation.

452. The new Middle schools will, in general, be staffed by specially-selected and re-trained upper primary teachers and by handcraft and homecraft teachers who have undergone a specialist course.

453. Non-graduate teachers for Forms 1–4 of secondary academic and secondary technical schools will require a 3-year post-School Certificate course involving some specialisation in those subjects they propose to teach.

454. The development of trade courses at the Derrick Technical Institute and vocational schools will require the services of an increasing number of qualified tradesmen who have undergone subsequent training as technical teachers—training which will have to be undertaken overseas for the time being. The development of higher level courses at the Derrick Technical Institute will require the services of appropriately-qualified expatriate instructors and lecturers until such time as local persons with the requisite qualifications are available.

REGIONAL UNIVERSITY

455. A scheme is under consideration for the establishment of a South Pacific Regional University in Fiji. Such an institution will be of great benefit.

Health

GENERAL STATE OF HEALTH

456. The general state of health of the community is good. The disease pattern conforms to that prevailing in more temperate climates. The exception to this rule is the high incidence of diabetes and of acute rheumatism to be found in the Indian population of Fiji.

457. The low standard of sanitation, especially in rural areas, poses however a constant threat; and with an increasing density of population, gastro-intestinal diseases including infant diarrhoea and typhoid can be expected to become an increasing danger. The high incidence of infective hepatitis reflects the same insanitary conditions.

458. Tuberculosis is still public health enemy number one. The yearly incidence of new cases is 1·1 per 1,000, but it is confidently expected to fall as a result of an intensive control programme. Leprosy is also a declining menace, although the pressure against this disease requires to be intensified rather than relaxed to achieve its eradication. Nutritional diseases have in recent years become a growing problem in young children, but the present Family Planning drive together with better food supplies should help with this problem; meanwhile the gift of skim milk powder in bulk by the United States of America supplies the necessary short-term answer.

HEALTH SERVICES

459. The population of Fiji is health-conscious and, although not unreasonable in their demands, requires an adequate level of medical services. This has been largely achieved in so far as the scope of services and staffing is concerned.

460. On the other hand, the Medical Department has had because of competing demands insufficient capital funds so that Departmental buildings almost without exception need urgent replacement with modern counterparts. The main requirement is, therefore, the rehabilitation of departmental facilities and their gradual development to keep pace with modern medical practice.

461. The Medical Department faces a major capital works programme because of the necessity to replace virtually every hospital, dispensary and nursing station. No new hospital has been built in Fiji since the Colonial War Memorial Hospital in Suva was completed in 1923. In the ten-year period 1954–1963 £F300,000 was spent on capital works of all kinds, whereas recurrent expenditure was running at about £F0·9 million per year.

462. The problem can only be resolved by a massive building programme in order of priority. The cost of such an extensive operation is considerable and will be upward of £F0·5 million a year. Unless high urgency is given to medical capital works, the rehabilitation of buildings will be extended over a very long period, possibly as long as 20 years.

HOSPITALS

463. The specialist Colonial War Memorial Hospital suffers from an overloading of all general wards. The number of beds has to be increased by 77 to a total of at least 350 by 1970. New surgical wards must be added without delay if the serious medical and social consequences of overcrowding are to be avoided.

464. The maintenance of the present Leprosarium at Makogai is quite uneconomical with the declining number of patients. A new hospital is, therefore, to be built at Suva with good hospital accommodation for 40 patients, together with male and female dormitory accommodation and recreational facilities for a further 60 patients.

465. A major Divisional hospital for Lautoka is at present on the drawing board in London and will have 300 beds. It is expected to be ready for occupation in 1970. Staff quarters have still to be provided for.

466. A new 100-bed hospital for Labasa is planned. This together with the retention of the present Tuberculosis Ward will provide 130 beds, an increase of 30 per cent. over the present state.

467. District hospitals are planned for Sigatoka and Savusavu, having 50 beds each. The designs will be similar and should provide a relatively simple level of accommodation and equipment. District hospitals are also planned for Nadi and Ra during the Plan period 1966–1970.

HEALTH CENTRES

468. The rural health service has remained very much a Cinderella and needs to be further re-organised and developed. The implementation of health policy concerning sub-district stations will do much to improve rural health services.

469. At present the three sections of the Department are insufficiently well co-ordinated, i.e.

(1) Curative,
(2) Public Health—Nursing,
(3) Public Health—Inspectorate.

There is also no administrative level between the Divisional Medical Officer and the individual Medical Units, leaving an insecure infrastructure to the administrative pyramid. It is planned to remedy this deficiency by setting up a series of sub-district headquarter stations under the charge of a qualified medical officer. The sub-district medical officer will be assisted at his headquarters by a Health Sister and Health Inspector together with a suitable complement of nursing, clerical and subordinate staff. The headquarters will be based on a Health Centre or a rural hospital. The first of these stations has been opened at Navua.

470. The replacement of rural health stations will require a capital expenditure of about £F200,000 during the Plan period 1966–1970.

QUARTERS

471. The inadequacy of present medical quarters almost without exception cannot be challenged. The gradual improvement of basic standards of education together with increasing responsibility and training of medical and dental officers and nursing staff has aggravated the situation. This staff will no longer accept the low standards of housing provided in the past, especially in the rural areas. A quarters building programme is therefore equally as urgent as rehabilitation of the medical units themselves, and this is being tackled concurrently.

CAMPAIGNS

472. No campaign in the field of preventive medicine can be successful without task assessment, careful planning and the co-operation of the public. Knowledge of the task depends on accurate and adequate statistical information. Health education is a continuing process.

473. The tuberculosis campaign in Fiji has been greatly assisted by the Tuberculosis Trust Fund which was set up as a memorial to those who fell in the Second World War. The B.C.G. campaign carried out between 1958 and April 1962 included the testing of 136,887 people below the age of 20, and 96,387 people were vaccinated with B.C.G. A total of 77,039 pre-school and school children were immunised with the B.C.G. in the campaign of 1964–1965. The incidence of tuberculosis is showing a continued fall from a rate of 1·66 per 1,000 in 1959 to 1·1 in 1964.

474. The campaign against leprosy is being closely associated with that against tuberculosis. The incidence of leprosy in Fiji was never high and has been dropping slowly over the years, in 1963 it was 0·09 per 1,000. So it may be safely said that leprosy is not a major health problem.

475. The Medical Department has immunised all school children against poliomyelitis and tetanus, and it is at present engaged in the closing stages of a campaign to vaccinate the pre-school population against tuberculosis, poliomyelitis, diphtheria, whooping cough and tetanus. Since inoculation against the enteric fevers is also given routinely, the completion of this campaign will see the child population of Fiji protected against all the infectious diseases encountered in Fiji for which immunisation is available.

476. Other subjects with which the Medical Department is concerned are rural sanitation, improvement in water supplies, hygienic disposal of excreta and mosquito control.

477. The relative isolation of many of the populations of the islands in the Pacific makes them particularly suitable for the study of epidemics of common virus diseases. The Trustees of the Wellcome Foundation have provided a grant of £13,500 for the building and equipping of a Field Laboratory in Suva in association with the Medical Department. The Tropical Medicine Research Board has agreed to provide funds for the running of this Laboratory and for the salaries of some of the staff at a cost of about £9,000 a year for five years. The Fiji Government will provide field staff, transport and services. The Virus Laboratory of the Microbiology Department of the University of Otago, with whom the idea of the project originated, is to act as the base Laboratory for the research.

STAFFING

478. Staffing of the medical services presents no problem. There are at present about 30 practising qualified doctors and 130 Medical Officers Class II and III. There are also 17 Dental Officers of various grades. Nursing sisters number about 80 and staff nurses 400. In addition, there is a full staff complement to run the various hospital and health services.

479. There are three under-graduate training institutes belonging to the Department:—

(*a*) Fiji School of Medicine including the School of Hygiene;
(*b*) Central Nursing School;
(*c*) School of Public Health Nursing.

480. The *Fiji School of Medicine* which accepts students from South Pacific Territories has two major courses:—

(*a*) Medical,
(*b*) Dental,

and it holds several so-called ancillary courses in

Dietetics,
Radiography,
Pharmacy,
Physiotherapy,
Laboratory Techniques,
Dental Hygiene.

481. These courses are both academic and practical; and are carried out partly at the School and partly at the appropriate professional units.

482. The School of Hygiene forms an integral part of the Fiji School of Medicine which trains Assistant Health Inspectors and Health Inspectors. The latter sit for the General Overseas Examination of the Royal Society of Health and are eligible for Membership of the Society.

483. The Medical Course is a shortened version of a full University Course and some students reach a high level of proficiency. The pre-clinical part of the course is carried out in the School and the final three years are carried out in the Specialist Units and Wards of the Colonial War Memorial Hospital and the other Specialist Hospitals. After qualification, graduates are required to carry out a year of rotating internship at the Colonial War Memorial Hospital or Lautoka Hospital before full registration is obtained. The Dental Course of three years duration is similarly arranged.

POST-GRADUATE EDUCATION

484. A planned programme of post-graduate education both local and overseas has been increasingly applied over the last ten years. Before this time, few locally qualified Medical Officers were given post-graduate training. This policy has borne fruit and there is now a cadre of locally trained officers with specialist skills. Their competence has been recognised overseas and both Melbourne and Auckland now offer provisional medical registration to local graduates selected for post-graduate courses at these centres.

485. A further favourable and recent development is that selected local graduates are to be allowed to take the Diploma in Health of the University of Otago and the Diploma in Obstetrics and Gynaecology of the University of Auckland. Two locally qualified Medical Officers have recently passed the D.P.H. Examination in Otago and another the D.Obst. at Auckland.

CENTRAL NURSING SCHOOL

486. This School trains nurses at two academic levels:—

(*a*) The Fiji Course—a three-year course designed for girls of lower educational standards;
(*b*) The Course to the New Zealand standard—entrants are required to have a secondary school education or previous nursing experience—nurses taking this course are eligible for registration in New Zealand.

Two post-graduate courses have recently been commenced:—

(i) Midwifery—to the New Zealand standard taking New Zealand examinations;
(ii) Public Health Nursing—this course of three months duration is held at the Public Health Nursing School, Suva, and is geared to Fiji's main public health problems.

PRIVATE MEDICAL SECTOR

487. There are 21 private doctors practising in Fiji. Their distribution is as follows:—

Suva	8
Ba	5
Sigatoka, Nadroga	2
Labasa	2
Lautoka	3
Nadi	1

The business may well stand a 50 per cent. increase in strength. These doctors provide general practice services with the exception of the J. P. Bayly Clinic which has an electrocardiograph.

488. The distribution of private dentists is as follows:—

Suva	4
Nadi	1
Lautoka	1

The number of dentists that can be absorbed into the private sector depends on the consumer demand. The demand for private dentists will increase in step with the development of public Dental Services.

Manpower Planning

489. It is becoming increasingly recognised that education and training have a vital part to play in a country's development. It is also being acknowledged today that this important matter cannot be left to what is called the forces of demand and supply in the market. Thus a deliberate approach to manpower problems must be adopted.

490. It may be said that, in some essential way, the people and their education, training and skills are a country's most valuable asset—more important in fact than the physical assets. The point is illuminated by the technical terms used in the literature on the subject, i.e. the formation of human capital as contrasted with the formation of physical capital. It is worth stressing that the education and training of people is more difficult and may take considerably longer than the acquisition of physical capital. It is needful, therefore, to give high priority to development of the skill possessed by the population, and to look well ahead in doing so.

491. Manpower planning as a subject is still in its infancy. But there is little doubt that education, manpower planning and general economic planning must be co-ordinated. It is difficult in practice to make a distinction between general education and specialised training, because the general education of character and mind, the teaching of general knowledge and vocational training are intimately connected. It is also clear that vocational training in the technical and narrower sense must be closely geared to forecasts of the demand for various levels and types of skill.

492. It is the general trend in education and training methods today to postpone specialisation, and to concentrate, as a matter of educational strategy, on the teaching of general subjects which will permit subsequent specialist training for specific jobs.

493. Requirements for the different occupations cannot be forecast in any precise way. What can be done is to forecast total manpower requirements with reference to the levels of skill which correspond to the different school qualifications provided by the system of education. Manpower planning of this kind is the only present method by which manpower objectives can be co-ordinated with educational objectives. More detailed manpower projections by specific jobs cannot easily be made compatible with future structural changes in the economy.

494. It is essential, therefore, that the rate of expansion of the educational system should correspond to the growing demand for the different levels of skill required by economic development. In the shorter-term looking, let us say, five years ahead, it is of course possible to form a fairly realistic view of the job openings in different skills which will occur and to try to give vocational training to the right numbers of people.

495. In the long-term development of the human resources of a country the educational system plays a key part. In particular, almost everything depends, in the first place, on the adequacy of the teachers themselves, both in numbers and in teaching proficiency. As a society becomes more sophisticated, it is secondary education in particular which plays a vital role. Secondary education often constitutes the master bottleneck in a country's progress.

496. Manpower planning seeks to achieve a balance in—

1. Overall employment,
2. Distribution by economic sectors,
3. Distribution by occupations or levels of skill.

497. For the present size of the labour force, and its composition according to economic sectors and occupations, estimates can only be made. These estimates may be taken as reasonable approximations to the truth. The Population Census undertaken during 1966 will supply better information than we possess now.

TOTAL LABOUR FORCE

498. Table 40 gives an estimate of the total labour force in Fiji for mid-1965 and mid-1970, broken down by economic sectors. The overall growth rate of the labour force implied in that Table is 3·5 per cent. per annum. The sectoral growth rates are also shown in the Table.

LABOUR FORCE — TABLE 40
(in thousands)

Sectors	Mid-1965			Mid-1970			Growth Rate per cent. per annum
	Self-employed and Salaried Staff	Wage Employ-yees	Total	Self-employed and Salaried Staff	Wage Employ-yees	Total	
Agriculture and Fishing	66·3	2·7	69·0	78·9	2·8	81·7	3·4
Forestry	·9	1·8	2·7	1·1	2·1	3·2	3·4
Mining and Quarry ..	·1	2·1	2·2	·2	3·1	3·3	8·4
Manufacturing	·5	5·7	6·2	·8	7·2	8·0	5·3
Constructing and Engineering	·8	7·8	8·6	1·0	9·4	10·4	4·0
Transport	2·3	2·9	5·2	2·7	3·3	6·0	2·9
Communications ..	·5	·6	1·1	·65	·65	1·3	3·4
Distribution	7·5	3·5	11·0	8·2	3·8	12·0	1·8
Banking and Insurance..	·3	·1	·4	·38	·12	·5	4·6
Electricity and Water ..	·1	·5	·6	·14	·56	·7	3·1
Tourism, etc.	·4	1·4	1·8	·8	2·2	3·0	10·8
Other Services	2·1	2·9	5·0	2·5	3·3	5·8	3·0
Administration	3·2	1·3	4·5	4·1	1·4	5·5	4·1
Health	1·4	·7	2·1	1·85	·85	2·7	5·1
Education	3·3	·3	3·6	4·3	·4	4·7	5·5
Other Professions ..	1·0	....	1·0	1·2	....	1·2	3·7
Unemployed	1·0	....	1·0	.....	....	....	....
	91·7	34·3	126·0	108·82	41·18	150·0	3·5

499. The rate of growth of high-level manpower requirements normally exceeds that of the unskilled labour force many times. The definition of high-level manpower covers managerial, professional and technical personnel, as well as the skilled craftsman trades.

HIGH-LEVEL MANPOWER REQUIREMENTS

500. The analysis of requirements for high-level manpower is done in terms of the higher output levels of the Fiji system of education, i.e.—

1. Cambridge School Certificate Grade I Pass, or New Zealand School Certificate, or U.K. General Certificate of Education " O " Level.
2. Graduates.

501. The New Zealand University Entrance qualification cannot be considered as a separate school qualification; first, it is taken only one year after the local equivalent of " O " level, and secondly, it is a pre-requisite for training at degree level rather than a job qualification as such.

502. In classifying and enumerating the high-level jobs in terms of requirements for "Graduates" and "School Certificate holders" the *desirable* education level for given jobs was used as the basis. The present holders of these kinds of job often do not possess the desirable educational qualifications on which the estimates of requirements are based. But it must be educational policy to turn out eventually enough persons with the right qualifications to fill all the relevant jobs. Manpower planning and educational planning must use figures arrived at by counting jobs according to the respective educational qualifications aimed at. This will also help in showing any gaps between targets and achievements, in other words, the educational shortfall.

503. Additional Net Requirements and Additional Gross Domestic Requirements are distinguished.

504. *Additional Net Requirements*—represent the actual increase in the "stock" of graduates and school certificate holders over the years.

505. *Additional Gross Domestic Requirements*—exceed Additional Net Requirements for two reasons: (1) they include replacement for losses in the existing stock due to retirement, emigration or any other reason, and (2) they allow for a policy of localisation; i.e. the substitution of local personnel for expatriates. Planning provision for replacement and localisation is bound to be somewhat arbitrary.

506. Replacement of the existing stock has been put at 10 per cent. for the period 1966–1970, or about 2 per cent. per annum.

507. Localisation would in the long run occur by itself if more and more of the jobs, formerly held by expatriates, were filled by local persons on becoming vacant. However, this would take a long time, and a policy of accelerated localisation may recommend itself. Evidently, no firm policy can be laid down for this by fiat. In the following estimates the assumption has been made that about 20 per cent. of the existing expatriates will be replaced by local persons between 1965 and 1970.

508. Tables 41 and 42 show the situation in 1965 and the requirements for 1966–1970 according to the definitions given above. The information is presented by Government and non-Government Sectors. The Sectors Agriculture and Forestry are excluded except in so far as the two respective Government Departments are shown in the Government Sector; this follows precedent in similar manpower surveys elsewhere.

MANPOWER—GOVERNMENT SECTOR — TABLE 41

	Situation 1965		Requirements 1966–1970			
	Total Nos.	Expatriates	Replacement 10%	Localisation	Net Additions	Total
I Graduates (Arts)—						
Administration(1)	94	39	....	....	32	....
Agriculture	8	5	....	....	4	....
Forestry	....	....	....	....	....	....
Education	150	83	....	....	80	....
Health	....	....	....	....	....	....
	252	127	26	20	116	162
II Graduates (Science)—						
Administration	47	19	....	....	25	....
Agriculture	37	22	....	....	15	....
Forestry	8	6	....	....	3	....
Education	48	27	....	....	48	....
Health	54	35	....	....	28	....
	194	109	19	20	119	158
III School Certificate (Administrative)—						
Administration	1,010	85	....	....	317	....
Agriculture	36	2	....	....	33	....
Forestry	8	....	....	....	2	....
Education	45	7	....	....	13	....
Health	66	....	....	....	18	....
	1,165	94	117	30	383	....
Stenographers	120	....	12	....	40	....
	1,285	94	129	30	423	582
IV School Certificate (Technical)—						
Administration	333	70	....	....	254	....
Agriculture	219	11	....	....	14	....
Forestry	73	4	....	....	39	....
Education	2,983	162	....	....	842	....
Health	974	33	....	....	216	....
	4,582	280	458	90	1,365	1,913

(1) Office of Colonial Secretary,
Archives,
District Administration,
Labour Department,
Public Relations Office,
Public Service Commission,
Crown Law Office,
Registrar-General,
Office of Financial Secretary,
Marine Department,
Secretary of F.A. and Local Govt.,
Native Lands and F.C.,
Social Services Office,
Communications and Works Office,
Judicial Department,
Legislature,
Police,
Printing,
Accountant-General,
Customs and Excise,
Inland Revenue,
Supplies Department,
Co-operatives,
Geological Survey,
Lands Department,
Libraries,
Prisons,
Transport,
Meteorology,
Audit,
Nadi Airport,
Local Government,
Defence.

MANPOWER—NON-GOVERNMENT SECTORS TABLE 42

	Situation 1965		Requirements 1966–1970			
	Total Nos.	Expatriates	Replacement 10%	Localisation	Net Additions	Total
I Graduates (Arts)—						
Communications	2	2	....	....	....	....
Professions*	80	23	....	....	10	....
	82	25	8	5	10	23
II Graduates (Science)—						
Electricity and Water	7	7	....	....	2	....
Communications†	17	8	....	....	6	....
Construction and Engineering ‡	72	63	....	....	25	....
Mining	20	20	....	....	30	....
Manufacturing	20	20	....	....	....	....
Professions	80	51	....	....	15	....
	216	169	22	30	78	130
III School Certificate (Administrative)—						
Elect icity and Water	12	....	....	....	11	....
Communications	107	14	....	....	34	....
Construction and Engineering	280	25	....	....	75	....
Mining	15	10	....	....	25	....
Manufacturing	130	30	....	....	150	....
Distribution	300	200	....	....	50	....
Banking and Insurance	300	250	....	....	80	....
Tourism	200	100	....	....	200	....
Professions	180	....	....	....	27	....
Transport	82	30	....	....	20	....
	1,606	659	160	100	672	932
IV School Certificate (Technical)—						
Electricity and Water	21	10	....	....	5	....
Communications	212	39	....	....	72	....
Construction and Engineering	480	80	....	....	100	....
Mining	65	30	....	....	45	....
Manufacturing	350	150	....	....	150	....
Professions	110	....	....	....	32	....
Transport	105	50	....	....	25	....
	1,343	359	134	50	429	613

* Excludes professional people employed by Government.
† Includes Posts and Telegraphs.
‡ Includes Public Works Department.

SUMMARY OF REQUIREMENTS

509. Table 43 summarises the high-level manpower situation in 1965, the Additional Net Requirements 1966–1970 and the Additional Gross Domestic Requirements 1966–1970. The implied annual growth rates are:—

	Net additions per annum per cent.	*Gross additions per annum per cent.*
Graduates	7·5	10·3
School Certificates	5·8	7·8

These rates compare with an assumed general economic growth rate of 5·6 per cent. per annum.

510. Educational policy must look further ahead than the end of the Economic Development Plan 1966–1970. It is necessary, therefore, to project forward to 1980 the growth rates found for the period 1965–1970. This is done in Table 44. It shows the annual net and gross additions, and the consequent rise in the stock itself year by year. The gross additions would be needed to achieve the annual increases in stock, on our assumptions regarding replacement and localisation.

HIGH LEVEL MANPOWER SITUATION 1965–1970 TABLE 43

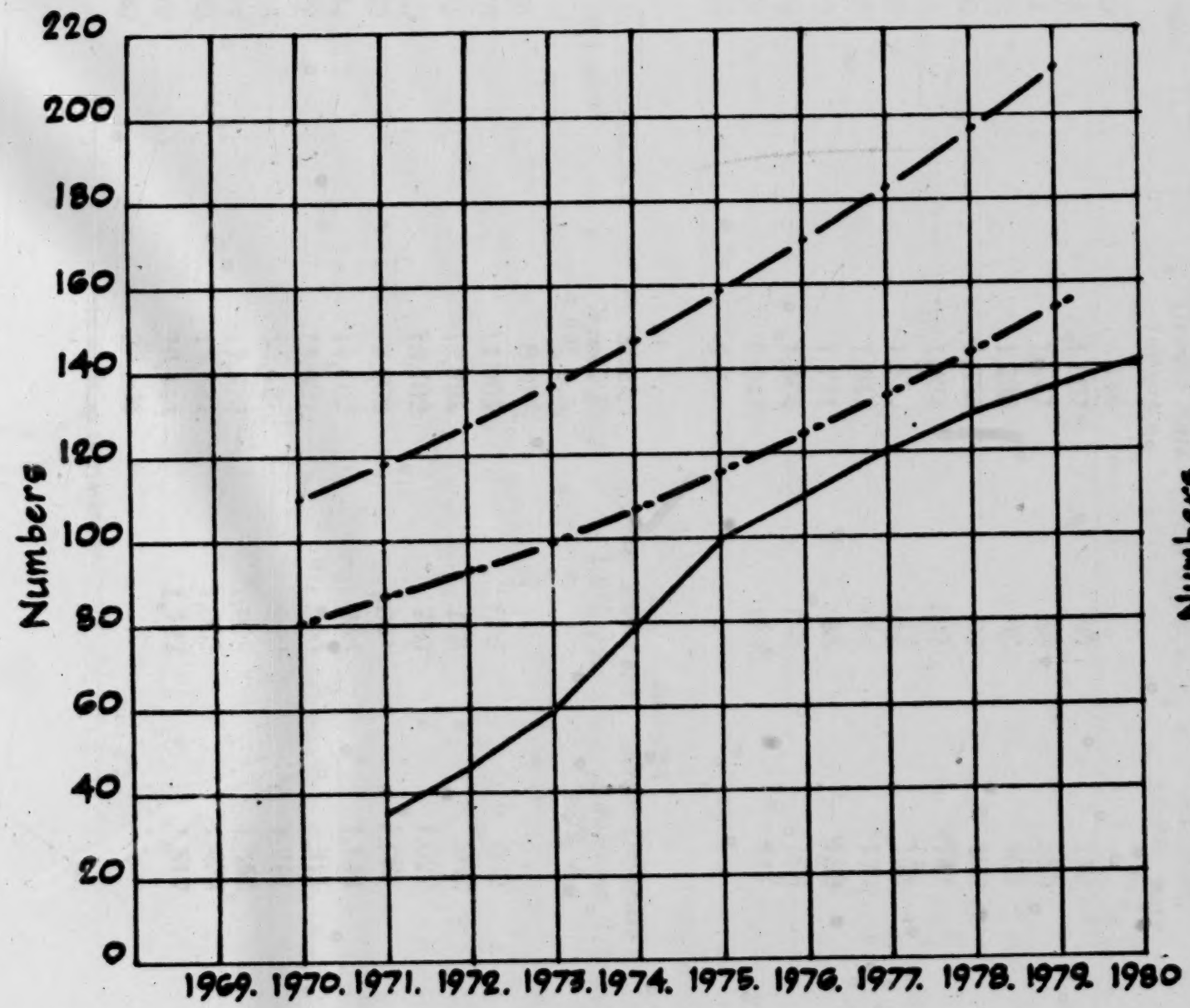
SUMMARY

	Government	*Non-Government*	*Total*
Situation 1965—			
Graduates (Arts)	252	82	334
Graduates (Science)	194	216	410
Total Graduates	446	298	744
School Certificates (Admin.)	1,285	1,606	2,891
School Certificates (Tech.)	4,582†	1,343	5,925
Total School Certs.*	5,867	2,949	8,816

HIGH-LEVEL MANPOWER : ANNUAL SUPPLY AND DEMAND

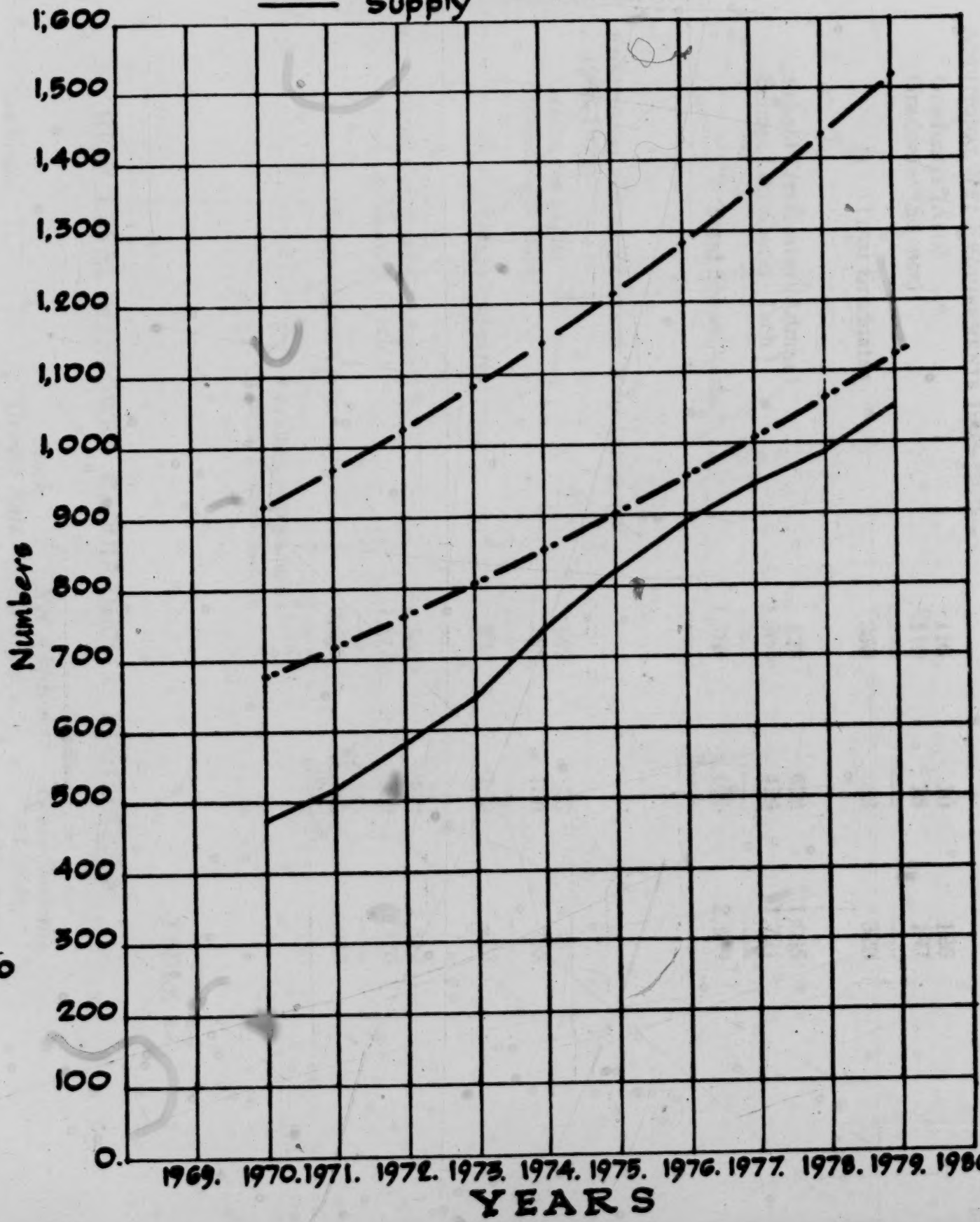
I. GRADUATES

·——· Gross Demand.
··—·· Net Demand
—— Supply.

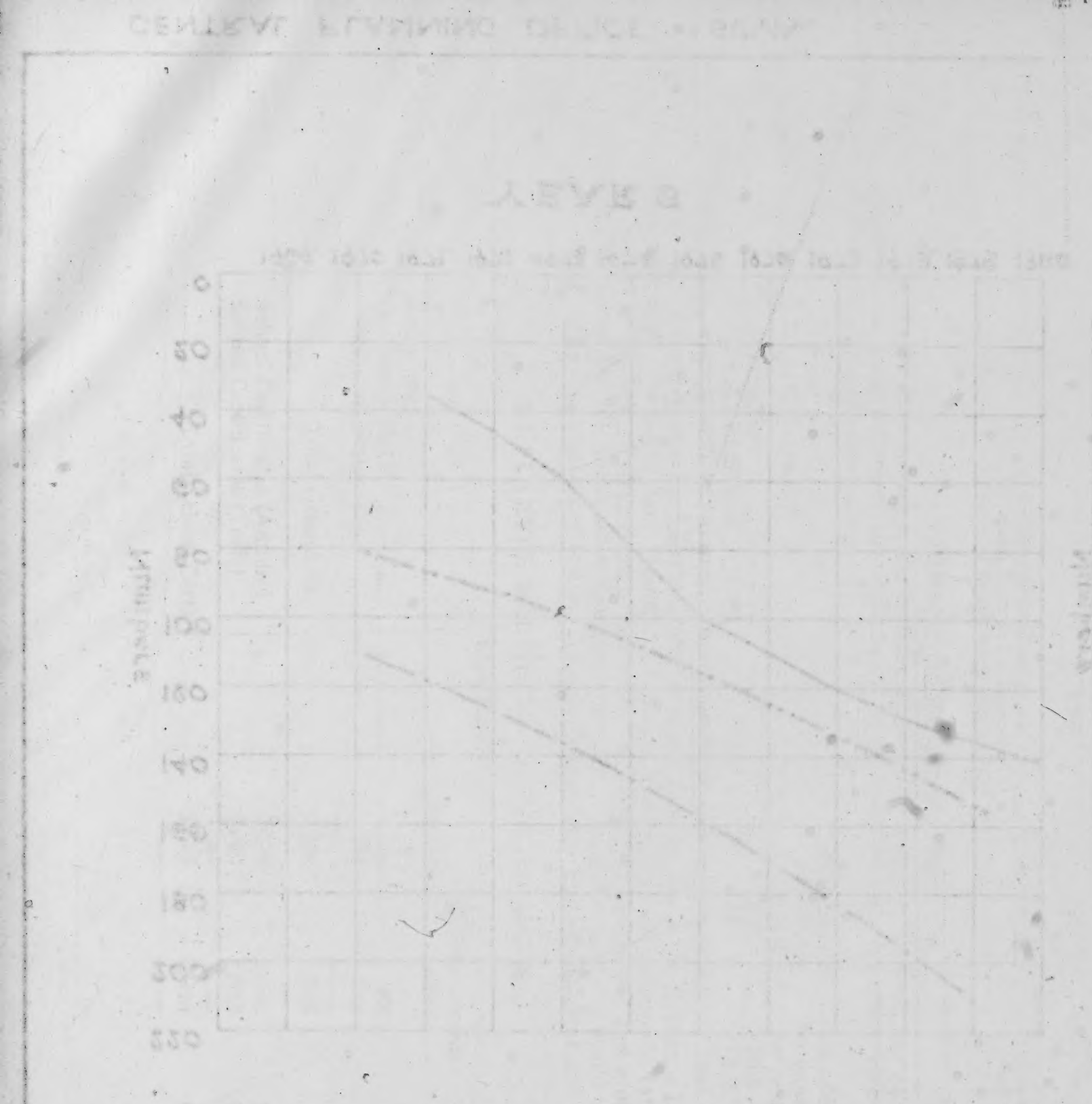


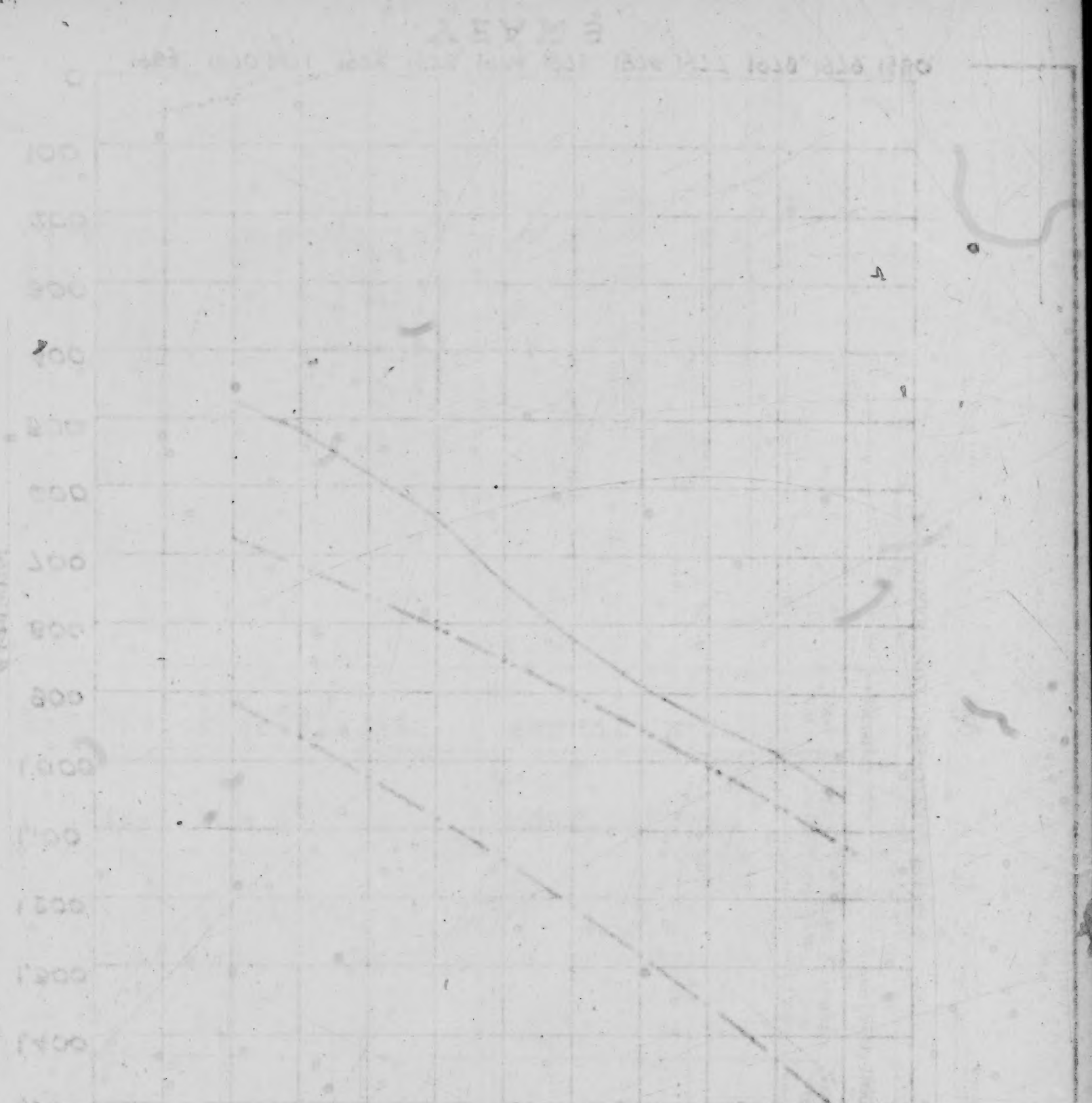
II. SCHOOL CERTIFICATES

·——· Gross Demand.
··—·· Net Demand.
—— Supply



CENTRAL PLANNING OFFICE • SUVA.





Additional Net Requirements 1966–1970—			
Graduates (Arts)	116	10	126
Graduates (Science)	119	78	197
Total Graduates	235	88	323
School Certificates (Admin.)	423	672	1,095
School Certificates (Tech.)	1,365†	429	1,794
Total School Certs.*	1,788	1,101	2,889
Additional Gross Domestic Requirements 1966–1970—			
Graduates (Arts)	162	23	185
Graduates(Science)	158	130	288
Total Graduates	320	153	473
School Certificates (Admin.)	582	932	1,514
School Certificates (Tech.)	1,913†	613	2,526
Total School Certs.*	2,495	1,545	4,040

* In addition to graduates.

† Includes school teachers.

TABLE 44

HIGH LEVEL MANPOWER REQUIREMENTS: PROJECTIONS

Graduates	*Stock Growth Rate 7·5% p.a.*	*Additions Net Additions 7·5% p.a.*	*Additions Gross Domestic Additions 10·3% p.a.*
1965	744	....	....
1970	1,067	80	110
1971	1,147	86	118
1972	1,233	92	127
1973	1,325	99	136
1974	1,424	107	147
1975	1,532	115	158
1976	1,647	124	170
1977	1,771	133	182
1978	1,904	143	196
1979	2,047	153	211
1980	2,200	....	....

*School Certificate**	*Stock Growth Rate 5·8% p.a.*	*Additions Net Additions 5·8% p.a*	*Additions Gross Domestic Additions 7·8% p.a.*
1965	8,816	....	....
1970	11,705	679	913
1971	12,384	718	966
1972	13,102	760	1,022
1973	13,862	804	1,081
1974	14,666	855	1,144
1975	15,521	900	1,211
1976	16,421	952	1,281
1977	17,373	1,008	1,355
1978	18,381	1,063	1,434
1979	19,444	1,122	1,517
1980	20,566	....	....

* In addition to graduates.

HIGH-LEVEL MANPOWER SUPPLY

511. The Department of Education has prepared forecasts of the school output from 1966–1975. The data are shown in Table 45.

TABLE 45

ESTIMATED SCHOOL OUTPUT 1966–1975

	Primary Education		Fiji Junior Certificate		School Certificate		University Entrance	
	Less than 8 years	Completed 8 years	Fail	Pass	Fail	Pass	Fail	Pass
1966	3,400	4,700	1,862	337	335	316	98	105
1967	3,500	4,800	1,904	374	277	320	119	139
1968	3 100	5 100	1,944	414	377	336	141	179
1969	3 000	5 600	1,976	456	419	331	172	238
1970	3 000	6 300	2,000	500	466	365	199	297
1971	2,400	7,000	2,100	525	514	402	219	329
1972	2 300	7,800	2,200	550	581	430	241	361
1973	2,400	8,250	2,300	575	612	451	258	387
1974	1,900	8,790	2,400	625	641	472	271	405
1975	1,700	9,100	2,600	650	640	512	283	425

512. The above figures for school output can be turned into "supply" estimates for Graduates and School Certificate holders. They show the numbers actually leaving school with the qualifications indicated.

513. The following table gives the supply and demand position for Graduates. The supply figures were calculated on the assumption that one-third of the pupils gaining their University Entrance qualification will obtain a degree, and that there is a five-year time lag between passing the Entrance qualification and entry into the labour market as Graduates.

TABLE 46

HIGH-LEVEL MANPOWER
SUPPLY AND DEMAND 1970–1980
GRADUATES

Year	*Additions to Supply*	*Demand* Net Additions	*Demand* Gross Additions	*Shortfall* Net	*Shortfall* Gross
1970	..	80	110	..	..
1971	35	86	118	51	83
1972	46	92	127	46	81
1973	59	99	136	40	77
1974	79	107	147	28	68
1975	99	115	158	16	59
1976	109	124	170	15	61
1977	120	133	182	13	62
1978	129	143	196	14	67
1979	135	153	211	18	76
1980	141	..	..	..	..

514. There will be a shortfall between the demand for Graduates and the supply. This means that expatriate Graduates will still have to be imported if all the job vacancies are to be filled. The shortfall is unfortunately not only in Gross Demand but also in Net Demand. This however is not the whole of the picture. While the number of local Graduates between 1965 and 1980 will increase roughly from 300 to 1,400, the number of expatriate Graduates will increase roughly from 430 to 790; thus in 1965 local Graduates accounted for 42 per cent. of all Graduates, and this proportion will rise to 64 per cent. in 1980. So two-thirds of all Graduate jobs will be held by local people in fifteen years' time.

TABLE 47

EMPLOYMENT OF GRADUATES 1965–1980

	Expatriates	%	*Locals*	%	*Total*
1965 ..	430	57·8	314	42·2	744
1980 ..	786	35·7	1,414	64·3	2,200

515. The corresponding supply and demand position for School Certificate holders is given in Table 48.

TABLE 48

HIGH-LEVEL MANPOWER
SUPPLY AND DEMAND 1970–1980

SCHOOL CERTIFICATE HOLDERS

Year	*Demand*			*Shortfall*	
	Additions to supply	*Net Additions*	*Gross Additions*	*Net*	*Gross*
1970	472	679	913	207	441
1971	518	718	966	200	448
1972	580	760	1,022	180	442
1973	645	804	1,081	159	436
1974	743	855	1,144	112	401
1975	818	900	1,211	82	393
1976	888	952	1,281	64	393
1977	943	1,008	1,355	65	412
1978	988	1,063	1,434	75	446
1979	1,050	1,122	1,517	72	467

516. The gross shortfall will be 48 per cent. in 1970, falling to about 30 per cent. in 1980. This situation may be judged as reasonably satisfactory.

WAGE EMPLOYEES

517. The number of wage employees is expected to grow from about 33,500 in 1964 to about 41,000 in 1970. An estimated breakdown by occupations is given in the Appendix at page 61.

518. It is part of manpower planning to assess the requirements and the supply for skilled tradesmen. The importance of this need not be elaborated. The limiting factor here is not the output of the education system in terms of primary or secondary education, but the number of available places in the vocational training institutions and the extent to which they are being utilised by Government or private employers.

519. The total number of apprentice registrations at 31st December, 1965, was 297, which represents an increase of 132 during the year. Actual requirements for the same date may be put at 364. Projections which have been made indicate that requirements for apprenticeship places will be in the region of 550 in the year 1970.

TABLE 49

APPRENTICE TRAINING
PROJECTED REQUIREMENTS

	1965			1970	
Column:	1	2	3	4	5
1. Aircraft Maintenance Engineering	20	5	4	40	10
2. Automotive Engineering . ..	268	67	61	377	94
3. Blacksmithing	33	8	5	50	13
4. Boilermaking	18	5	21	32	8
5. Cabinetmaking	10	3	3	17	4
6. Carpentry and Joinery	443	111	52	720	180
7. Electrical Fitting and Mechanics	143	36	48	166	42
8. Fitting and Machining	238	60	67	386	97
9. Motor Body Building	20	5	3	25	6
10. Plumbing	95	24	12	126	32
11. Refrigeration Mechanics	5	1	3	10	3
12. Shipbuilding	30	8	16	40	10
13. Welding	94	24	..	140	35
14. Wood Machining	26	7	2	50	13
Totals ..	1,443	364	297	2,179	547

Index to Columns :—

Column 1—Actual skilled labour force calculated on the basis of the number of persons employed in the trade who were earning 3/½d. per hour or more.

Column 2—Optimum total number of apprentices (25 per cent. of skilled labour force—5 years x 5 per cent. per year).

Column 3—Actual number of apprentices at 31st December, 1965.

Column 4—Projected skilled labour force in 1970.

Column 5—Optimum total number of apprentices in 1970 (25 per cent. of column 4 figure).

520. The total number of apprentices in training at the present time falls short of requirements by about 70. There should, however, be an addition of about 40 to allow for building students enrolled at the Ratu Kadavulevu School who do not enter apprenticeship until after they have successfully completed the school course. These figures indicate that apprentice training is already well established in Fiji and has become recognised by most employers as an integral part of the industrial scene.

521. It should however be noted that even with the allowance referred to above, the number of apprentices employed in the building industry falls somewhat short of the optimum figure:—

	Optimum	*Actual*
Carpentry and Joinery	111	92 (52 + 40)
Plumbing	24	12

— whereas in the engineering industry the number of apprentices employed is, for the most part, approximately equal to the theoretical training requirement—

	Optimum	*Actual*
Automotive Engineering	67	61
Boilermaking/Welding	29 (5 + 24)	21
Electrical Fitting and Mechanics ..	36	48
Fitting and Machining	60	67

522. In view of the likely demands upon the resources of the building industry during the period of the Development Plan, it would seem wise to encourage by all possible means, further recruitment of building apprentices, particularly in carpentry and joinery and in plumbing.

523. The projections of requirements must, of course, be taken with certain qualifications. While they reflect the different growth rates expected for the industries in which the skilled tradesmen will be employed, they cannot anticipate all the changes which may occur in the structure of the economy. Thus flexibility will be necessary to cope with changed or new demands for skilled labour. It is, however, reasonable to assume that the total number of apprentices will be approximately as forecast.

524. Whilst it is difficult to determine an exact training capacity for an institution such as the Derrick Technical Institute since in certain circumstances one can adopt undesirable expedients such as the grouping of classes or the extension of the teaching day to increase that capacity, the general indications are that with the extensions now being planned the Institute buildings will be able to meet the projected commitment of apprentice training. At the same time the Institute will be able to provide accommodation for the higher courses due to be established over the next five years. The staff requirement for apprentice training would be of the order of 25–30 instructors of whom 18 are already provided for in the existing establishment.

Financial Planning

525. One of the main subjects in planning is normally a survey of the available investment finance in relation to the need for investment. It is usually a matter for anxious concern how the gap between investment requirements and actual investment capital is to be filled.

526. It is not possible in Fiji to assess the investment situation in these terms in any meaningful way. The main reason for this is the unhindered movement of free funds into and out of the country. It should be said at once that this exchange freedom is at present working to the advantage of Fiji.

527. Domestic private or corporate savings may be kept in Fiji or transferred overseas. In fact, a very large proportion is probably invested overseas in countries like Australia, New Zealand or Britain. On the other hand, funds are brought into Fiji for current expenditure or investment as desired.

528. A substantial part of company profits and personal savings is in expatriate hands. The disposition of this money is therefore subject to special considerations, but there has been ready willingness to invest in Fiji. Expatriate residents have also been bringing into Fiji, funds earned and saved in their home countries for investment here.

529. Statistics on invisible transfers are not available, so that only broad guesses can be made of the balance of payments.

530. In this situation it would serve little purpose to estimate the size of domestic savings capital, if it can be done, with reference to Fiji's investment requirements.

531. As far as public investment is concerned, an assessment was made earlier on in this Review.

532. Two conditions will determine the volume of private investment in Fiji. They are :—

(1) the existence of profitable investment opportunities, and

(2) confidence in the political and social stability of the Colony.

One may assume that, if these conditions are fulfilled, there will be no shortage of investment capital.

APPENDIX

WAGE EMPLOYEES BY OCCUPATIONS 1964 AND 1970

Occupations	1964	1970
Agricultural and Forestry Workers—		
Copra cutter	795	840
Gardner—market	24	30
Livestock Attendant	181	200
Worker—Agricultural	1,387	1,429
Firewood cutter	62	108
Logger	129	300
	2,578	2,907
Mining and Quarrying Workers—		
Drillers	43	66
Mine Worker—Gold	729	1,000
Mine Worker—Others	....	350
Quarryman	21	57
	793	1,473
Workers in Transport and Communications—		
Ship's Master	51	59
Ship's Mate	19	30
Ship's Engineer (Certificated)	12	18
Ship's Engineer (Uncertificated)	47	64
Other Ship Workers	345	459
Drivers—Locomotive	85	110
Drivers—Rail Motor	49	60
Drivers—Road Transport	1,485	1,747
Firemen—Locomotive	49	70
Other Workers	110	130
Telephone and Telegraph Workers—		
Telephone Operators	176	222
Telephone Repairmen and Technicians	21	49
Radio Technician	23	35
Mail Workers	53	71
Other Workers—Messengers	238	313
Total Transport and Communication Workers	2,763	3,437
Craftsman, Production and Process Workers—		
(i) *Clothing and Related Work—*		
Tailors	484	574
Upholsterers	51	60
Bootmakers	32	52
Sailmakers	10	25
	577	709
(ii) *Engineering Workers—*		
Blacksmiths	68	98
Moulders	13	20
Tinsmith	19	25
Boilermakers	83	127
Fitters	243	333
Fitter and Turners	145	259
Welders	181	269
Plumbers	229	296
Turners	25	36
Machinists—Engineering	19	30
Machinists—Woodwork	82	145
Electricians	321	432
Linesman	87	125
Mechanics—Diesel	52	77
Mechanics—General	128	209
Mechanics—Instrument	10	12
Mechanics—Motor	680	855
Engineers—Motor	23	36
Engineers—Refrigerator	18	30

Occupations	1964	1970
Machine Operators—		
Stationary Engine	137	197
Tractor or Bulldozer	388	558
Crane	34	55
Riggers	15	17
Others	97	122
	3,097	4,363
Related Workers—		
Jewellers and Watchmakers	16	26
Printers, Bookbinder	28	35
,, Machinist	38	45
,, Compositor	47	55
,, Foreman	9	12
,, Other Workers	18	30
	156	203
(iii) *Building Workers—*		
Carpenters	1,495	2,062
Blockmakers	32	60
Painters	570	890
Signwriters	13	22
Plasterers	215	266
Cabinet and Furniture Makers	153	223
Joiners	199	300
Coachbuilders	41	50
Boatbuilders	51	75
Sawyer and Benchman	139	165
Others	14	28
	2,922	4,141
(iv) *Other Workers—*		
Bakers	143	160
Butchers	45	67
Factory Workers	839	1,465
Others	42	60
	1,069	1,752
Services—		
Cinema Workers	73	85
Cooks	440	555
Hairdressers	20	25
Laundry Workers	243	306
Nursing Orderly	49	67
Petrol Pump Attendant	104	142
Servants—Hotels, Clubs	914	1,120
Caretakers	318	426
Handyman	86	133
Cleaners	98	128
Meter Reader	20	29
Salesmen	1,342	1,500
Storeman	389	468
Photography Workers	32	40
	4,128	5,024
Other Workers—		
Foremen	621	809
Labourers	14,726	16,362
	15,347	17,171
Grand Total	33,430	41,180